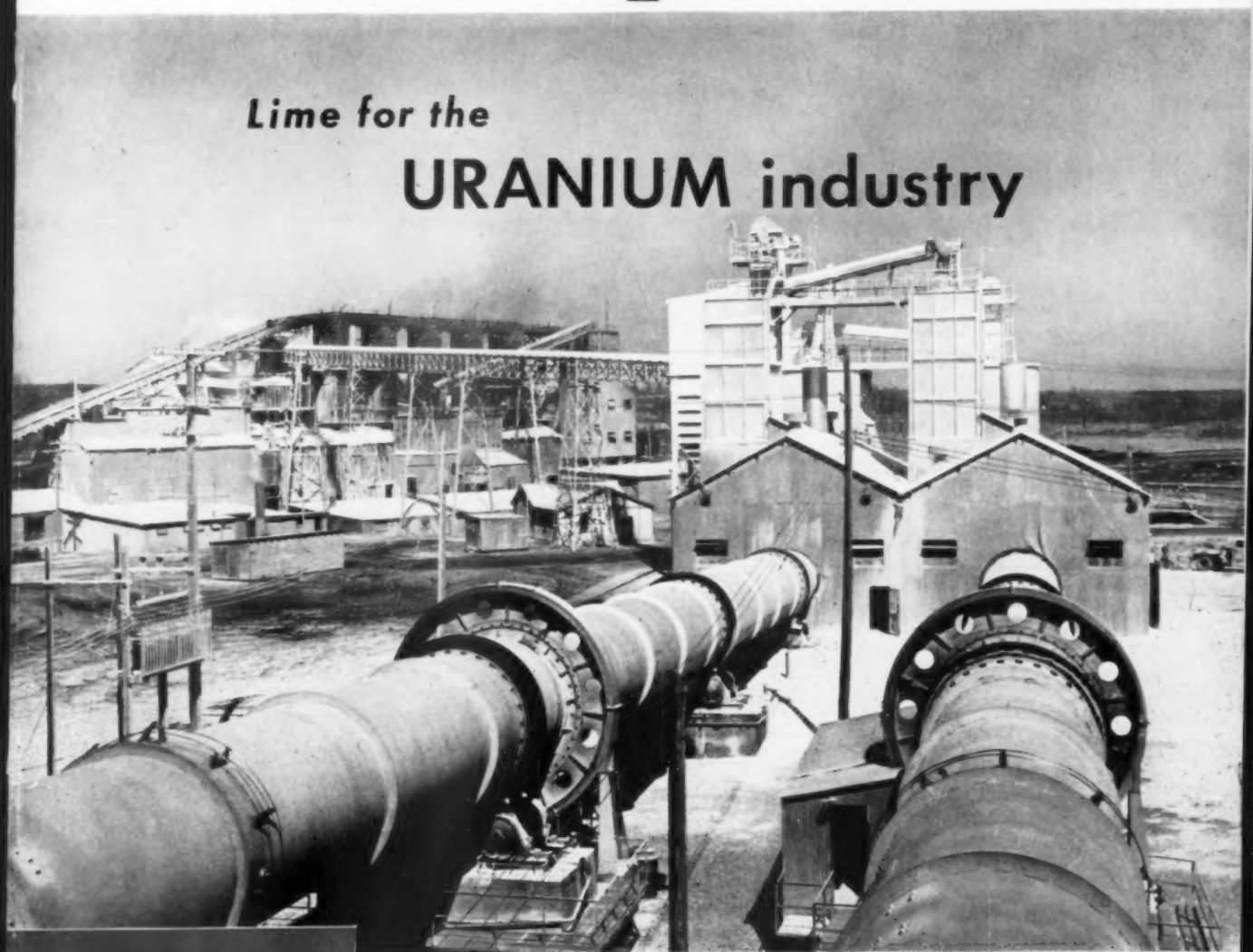
For producers of Sand, Gravel, Crushed Stone, Slag, Cement, Lime, Gypsum, and other nonmetallic minerals

MAY 1958

PIT and QUARRY

Lime for the URANIUM industry



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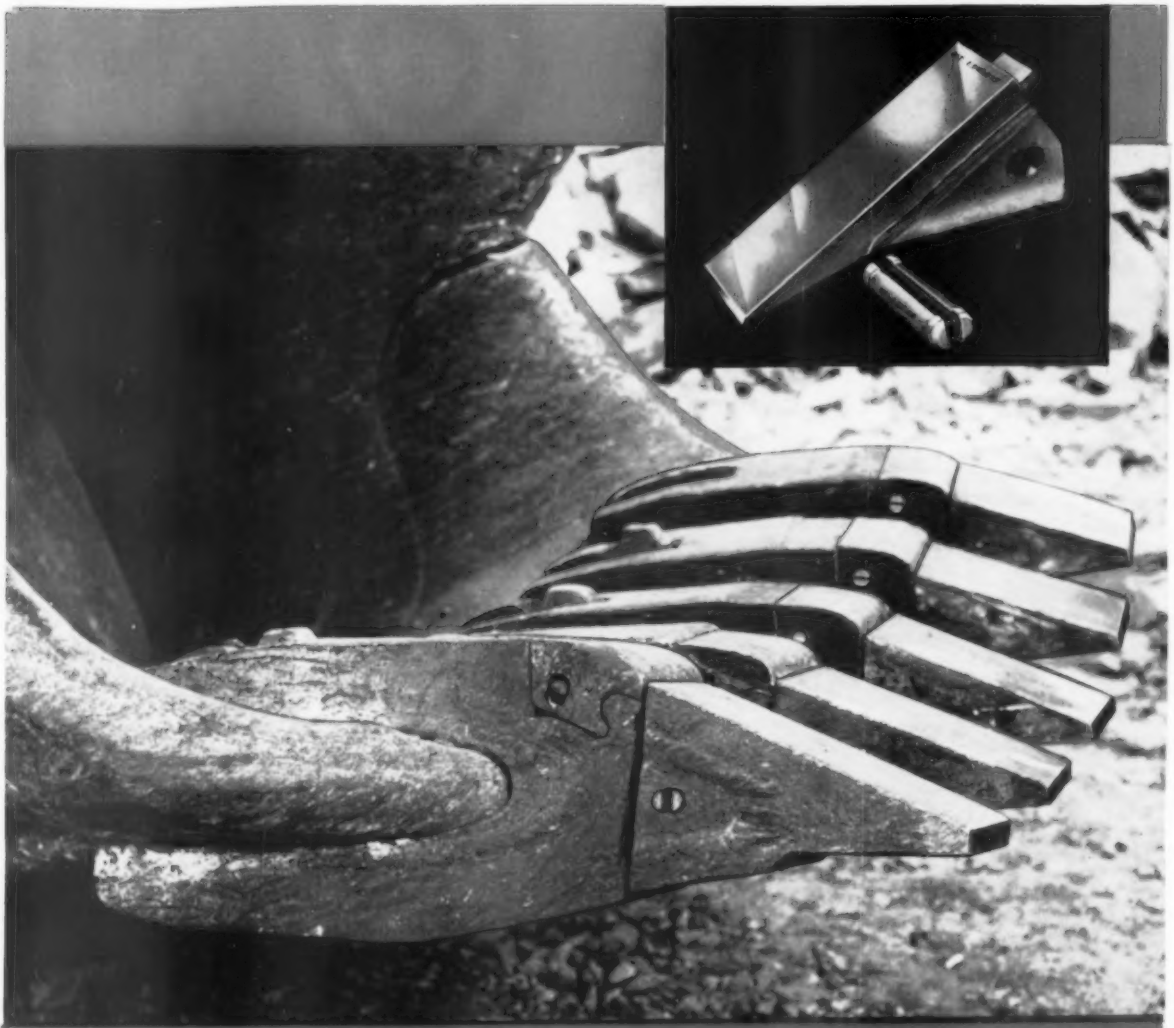
ANNUAL LIME AND AGSTONE ISSUE



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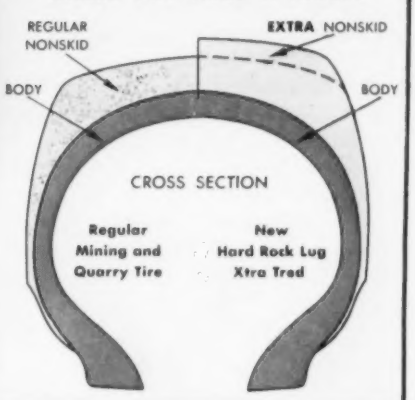

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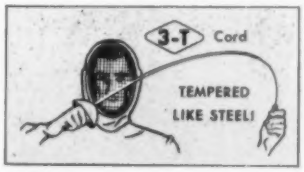

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pit and quarry

THE BASIC MAGAZINE IN A BASIC INDUSTRY

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• • •

Cover Picture

• The cover picture on this issue of PIT AND QUARRY shows the expansion which has recently been made in one Canadian lime plant to supply the growing demands of the uranium industry in the Blind River area of northern Ontario. At the left are the five original shaft kilns of Gypsum, Lime & Alabastine, Canada, Ltd., Beachville, Ont. The sixth shaft kiln and the two rotary kilns in the foreground were installed in 1956-57 to meet these demands. A new crushing and screening department is not shown.

• • •

Published on the first of each month for producers and manufacturers of Cement, Crushed Stone, Gypsum, Lime, Sand, Gravel, Slag and other nonmetallic minerals.

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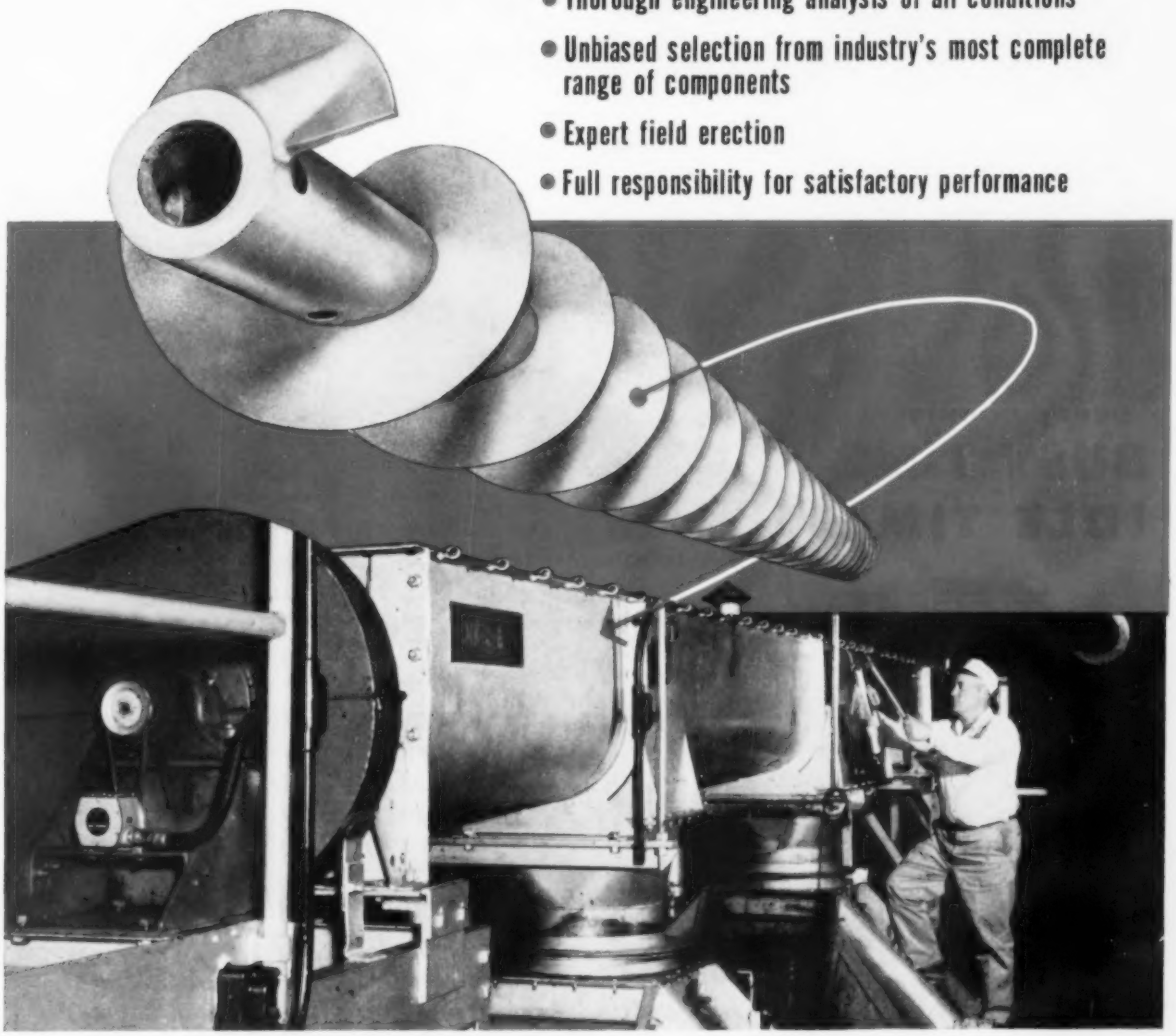

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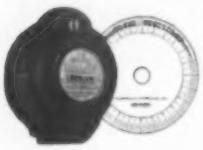

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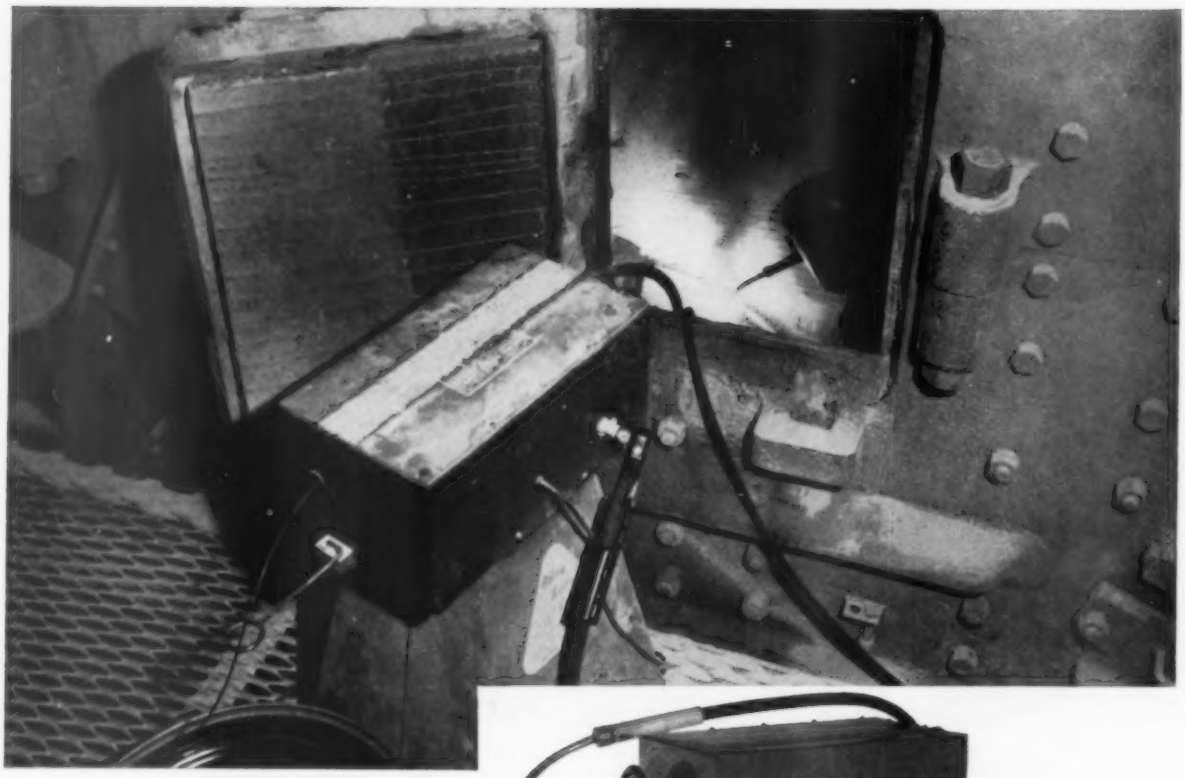

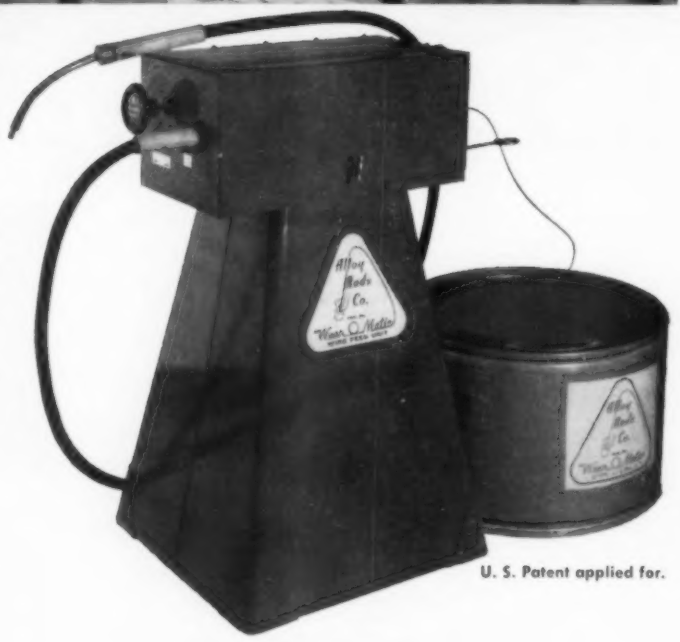

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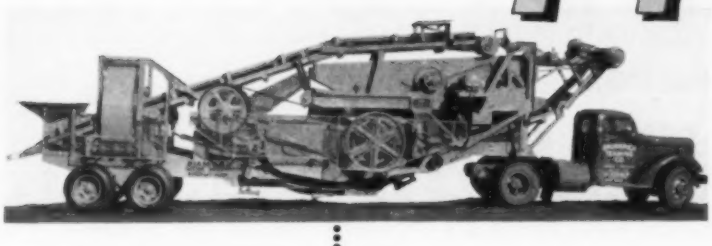

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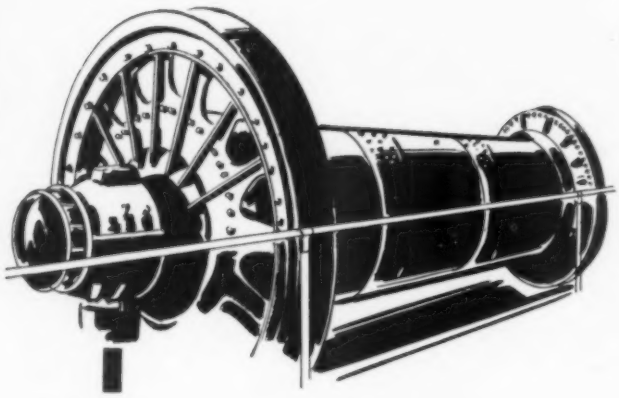

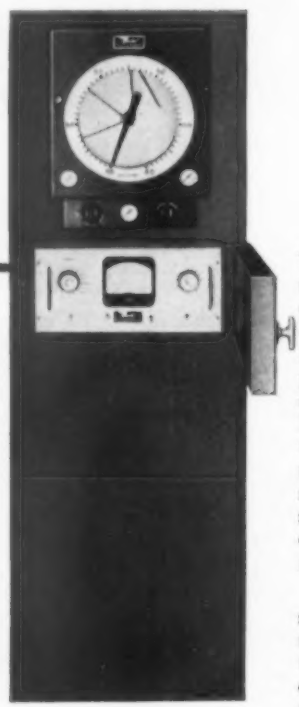

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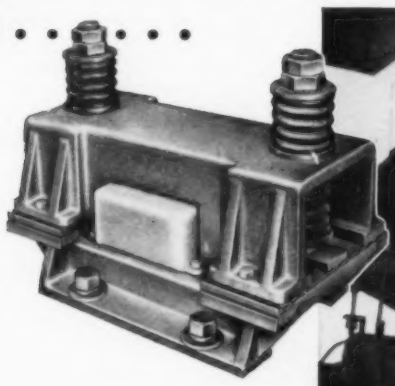
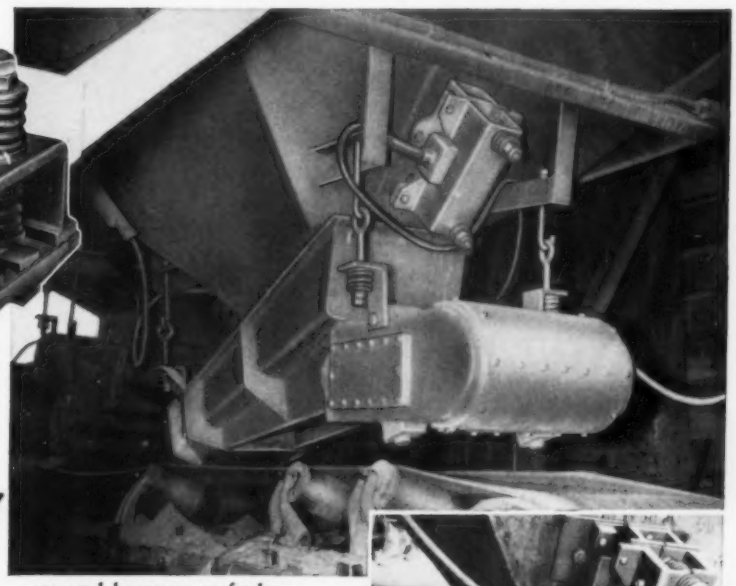
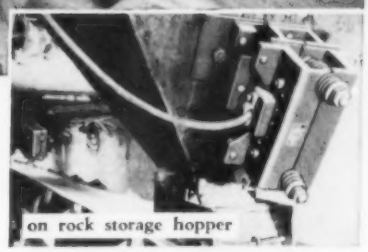




on sand hopper over feeder



on rock storage hopper

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pit and quarry

MAY, 1958

Limestone Mines— as Warehouses and Shelters

WITH the demand for nearly everything down from earlier levels, businessmen in general are missing no opportunities to cut their costs and prevent waste. In the nonmetallic minerals industries, which are probably all operating at levels under those of a year ago, most of the producers are undoubtedly giving special attention to operating efficiency and economy. Some of them, however, have been wasting an asset which might be made profitable, and might even become of great strategic importance. This potential asset is in the worked-out mining areas, particularly in limestone, which are lying idle throughout this country.

Again and again for the last 30 years or more we have in these pages described the ways in which such mines are being used for a variety of purposes. One of the early practices which is still popular is to use these man-made caverns for mushroom growing, for which they are ideally suited. One of the first to use a worked-out limestone mine for storage purposes was the George W. Kerford Quarry Company at Atchison, Kans. There the government in 1948 began to use this mine for the cold storage of meat, surplus eggs, etc. This project received wide publicity at the time.

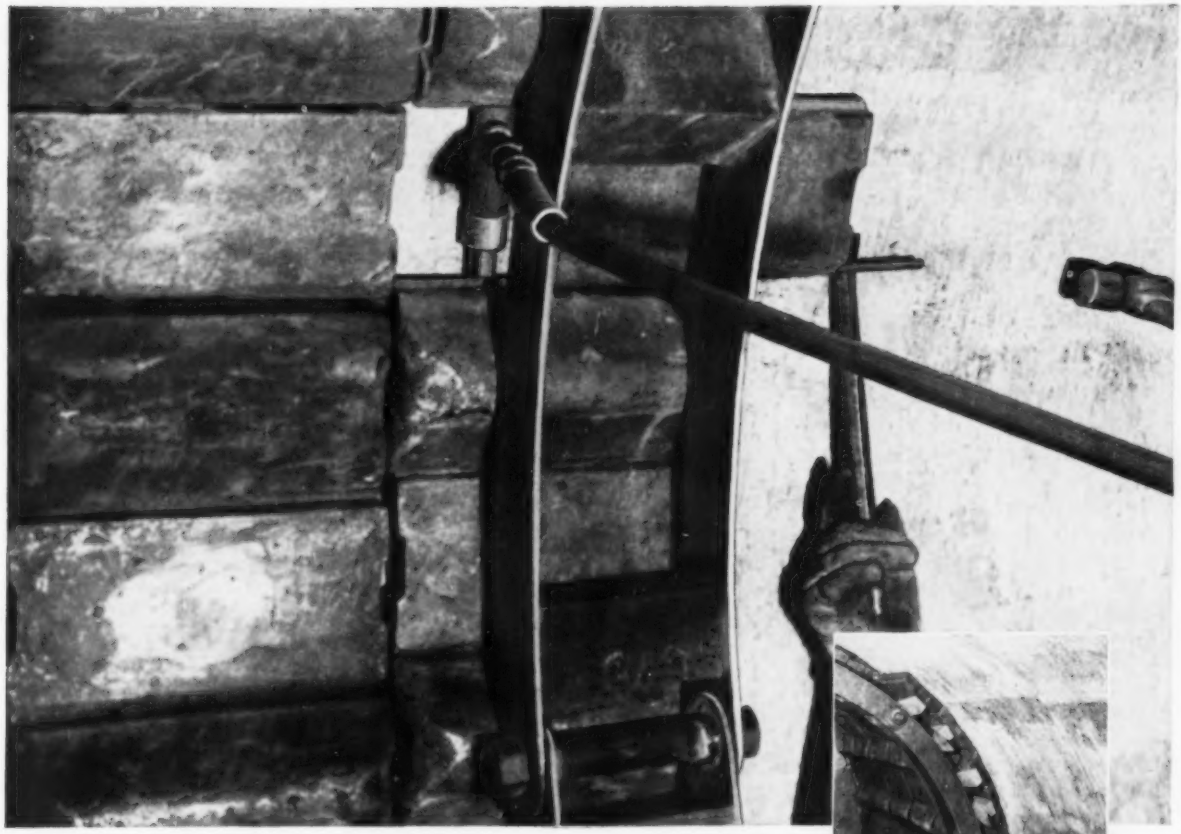
A MORE recent advocate of the practical use of such mines, but one who has developed this practice to a high degree is Russell W. Hunt, president of the Southwest Lime Company, Neosho, Mo. Mr. Hunt did not actually start to convert and equip his mine until early in 1956, but he now has 600,000 sq. ft. of clean, ventilated storage space, much of which is being put to profitable use.

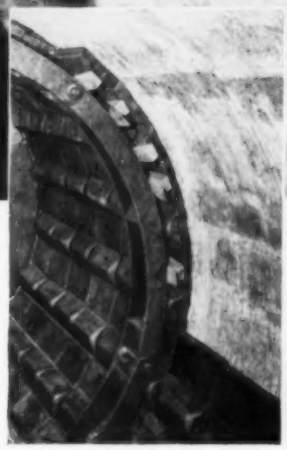
Mr. Hunt has not confined his efforts to his own operations and profit; he has spent considerable time and effort in trying to sell this idea to other producers, the government, etc. He has given numerous talks before producer groups, and his operations have been written up repeatedly in these pages and elsewhere. His presentation on this subject was a feature of the recent agstone and lime conventions.

When he equipped this mine as a storage area, Mr. Hunt's purpose was primarily commercial. In his recent addresses, however, he has emphasized the importance of such mines in case of atomic warfare. Underground shelters can serve not only for protection against a blast, but also as shelter during the ensuing fallout and contamination which would endanger even more people. The underground storage of food, medicine, etc., would also be necessary.

ALL operators of underground mines should study the feasibility of converting their worked-out areas for storage purposes and for possible strategic use. All operators of rock deposits, which might be converted to underground mining, would also do well to consider the possibility of going underground if the necessity should arise. Many of them are already faced with this decision because of increasingly heavy overburden, the growing scarcity of easily accessible deposits, or other reasons.

Walter E. Trasoffer





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2. Then, place in position a simple installation form and complete the ring of liners without turning the mill. The last casting in each ring is wedged tightly into place by means of a hydraulic ram and locked with a pin. The joints are designed to permit the use of a spacer pin where needed. The number of pins in a ring depend upon shell variations and lifter centers used.

With B&W Universal Liner Plates, direct labor cost and installation downtime are reduced. Small, lightweight castings are easily handled, minimizing worker fatigue and eliminating the necessity for cranes. Also, B&W Universal Liner Plates give longer life of greater usefulness. Uniform wear results from better quality control on a mass production casting with permanent molds. You save money on liner inventory, breakage claims and delays for replacements. Positive seating of small castings on mill shell means less breakage of castings under operating conditions. Costs are also reduced for storage space since small castings stack easily.

Liners are supplied in two nominal thicknesses, 1½″ and 3″ with 1½″ high lifters. Castings are 6″ wide x 12″ long. For additional information on B&W Universal Liner Plates, write The Babcock&Wilcox Company, Process Equipment Dept., Barberton, Ohio.

S-472

BABCOCK & WILCOX

BOILER DIVISION

Washington News Letter

By S. HERBERT UNTERBERGER

EACH year, various agencies of the Federal Government make two very important surveys. The first, made by the Federal Reserve System, deals with consumer finances. It provides information not only on the incomes of individuals and families but also upon their evaluations of their future financial situations, their expectations with respect to business conditions, and their purchase plans for the years to come.

The other study, conducted jointly by the U.S. Department of Commerce and the Securities and Exchange Commission, provides counterpart information on businessmen's expectations with respect to their sales and their expenditures for plant and equipment. These studies provide a preview of what may be expected in the year to come. In past years they have been surprisingly accurate. For example, last year's studies showed that businessmen expected to spend $37,000,000,000 on plants and equipment. The actual figure came within one percent of that estimated amount. While the results, generally, are not believed to be that accurate, nevertheless, they have come close enough to be highly regarded as predictors of things to come.

Consumer Finances While this year's surveys generally reflect a less than optimistic economic situation, they do contain some surprises, particularly with respect to the size of the economic down-turn which they foretell.

The most significant finding of the survey of consumer finances was that while many consumers were pessimistic about the business situation during the coming year, very few thought their own incomes would decline. About two-fifths of the consumers interviewed in January and February of this year expected "bad times" during the year, and about one-third "good times." This was a less favorable expectation than was reported in any other survey of consumer finances since the surveys were first begun in 1948.

Despite this general pessimism about business conditions, however, 37 percent of the consumers interviewed counted on earning more a year from now than they are earning now and only 11 percent expected to be earning less a year from now. Only in the years 1957 and 1955 did they appear to take a significantly more optimistic view. With respect to their total financial situation, about one-third of the consumers reported they were better off than a year ago, and slightly less than one-third reported that they were worse off than a year ago. Here again, the situation was as good as or better than any of the years except the last three or four.

This generally optimistic view of consumers about their own situations is reflected in their plans to make purchases during the year 1958. More than 7 percent of the consumers interviewed planned to buy either a new or used house during the forthcoming year. For the last three years, approximately 9 percent of the consumers interviewed expected to make such purchases. This is a decline in expectations, but far from a disastrous drop. In these three years the proportion of consumers planning to make major home improvements remained the same, somewhere around 22 to 23 percent.

The problems of the automobile industry are reflected in plans to purchase. Only 6.6 percent of the consumers planned to purchase new automobiles this year. This is lower than the figure for any year except 1951. In the last several years the figure has run in excess of 8 percent. On the other hand, the largest proportion of consumers ever recorded plans to buy used automobiles this year. More than 10 percent of them indicated such plans.

Also, with respect to furniture and major house appliances, the proportion of consumers who expect to purchase such items does not appear to have fallen below the level of recent years. All told, if we are to have a continuing economic recession, it will not be the fault of the consumers' unwillingness to buy anything except, perhaps, new automobiles. If consumers' purchases do not meet their expectations, it will be because a decline in general business conditions has affected their incomes much more than they had anticipated.

Sales Expectations Every purchase that a consumer makes is, of course, a sale to a businessman. It should be no surprise, therefore, to find that businessmen's sales expectations conform fairly closely with the consumers' purchasing plans.

The available data are limited to the sales expectations of manufacturers, but they are, nevertheless, quite illuminating. Over all, manufacturers expected sales to drop by no more than 2 percent. This does not mean that every type of manufacturer is expecting a drop of only this amount. There is substantial variation among the different types of industry. On the average, the durable goods industry anticipates a drop of about 5 percent, while the non-durable goods industry expects an increase of about 1 percent.

The worst decline in sales is expected in the transportation equipment industries, which include automobiles, and in the primary iron and steel industry, which supplies a large portion of its output to the automobile industry. These two groups expect a drop of about 12 percent.

On the other hand, chemicals and

(Continued on page 71)

Convert Unsuitable Materials into

Specification Sand

BY processing rock, coarse aggregate, and unusable natural sand, the Allis-Chalmers rod mill gives you specification sand *where and when you want it*. It extends the life of natural deposits. It eliminates the expense and inconvenience of distant shipments.

Specification Flexibility

Meeting varying specifications with an Allis-Chalmers rod mill is merely a matter of changing feed, feed-water rate, or rod charge. Once mill is adjusted to produce a required product, it needs very little attention.

Cubical Product

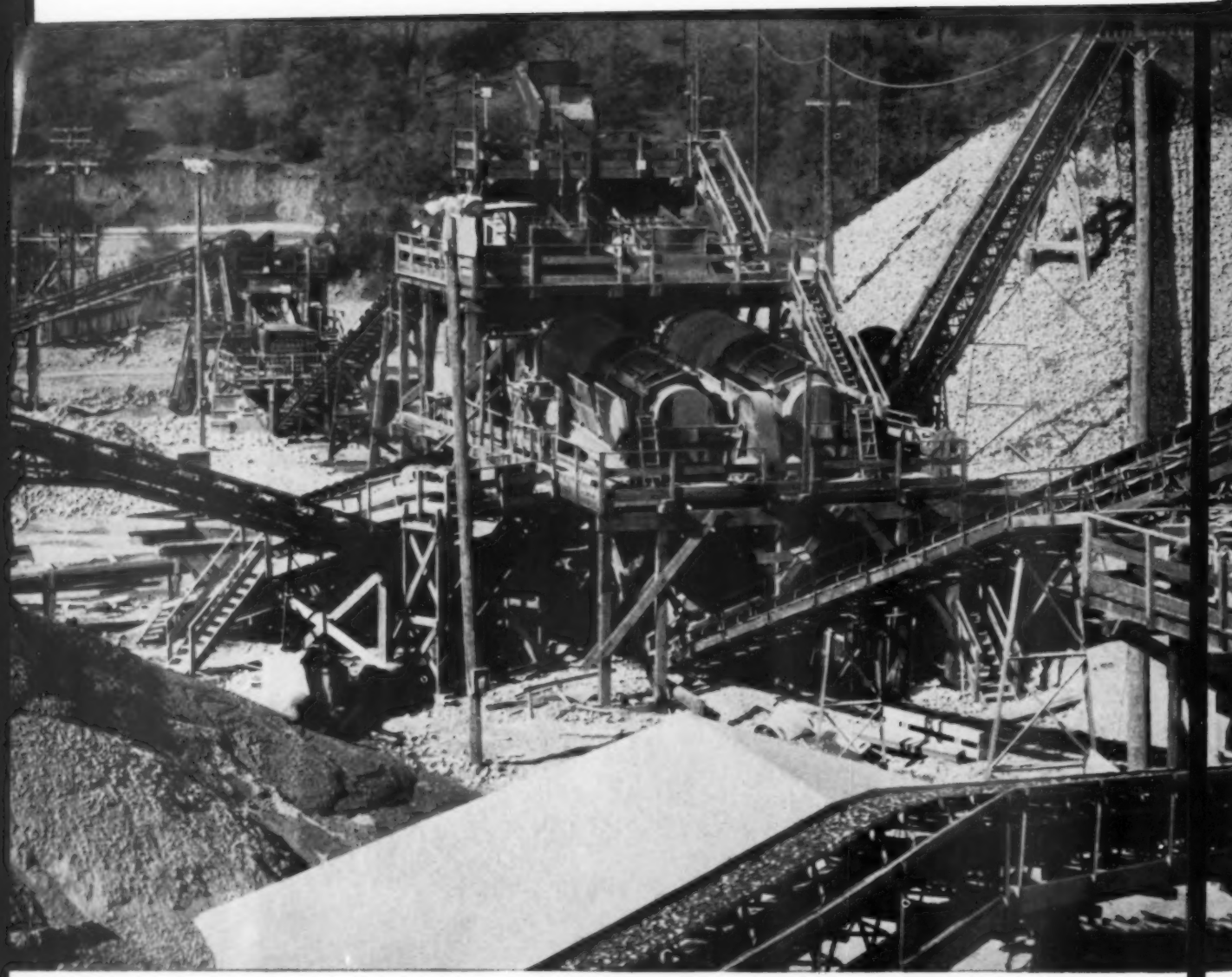
Rod mill action breaks long, flat particles . . . knocks corners off rough pieces, yet does not produce an excessively smooth particle. Size distribution is excellent. Product is ideal for use in concrete.

"Manufacturing" sand is a particularly tough, abrasive operation. That's why you'll want the Allis-Chalmers rod mill. It's a rugged machine that has proven most economical for grinding sand — in terms of long life and low operating costs.

For complete information, see your A-C representative or write Allis-Chalmers, Industrial Equipment Division, Milwaukee 1, Wis. Ask for Bulletin 07B6718A.

ALLIS-CHALMERS

A-5311



Six Texaco lubricants can solve all your major lubrication problems with the

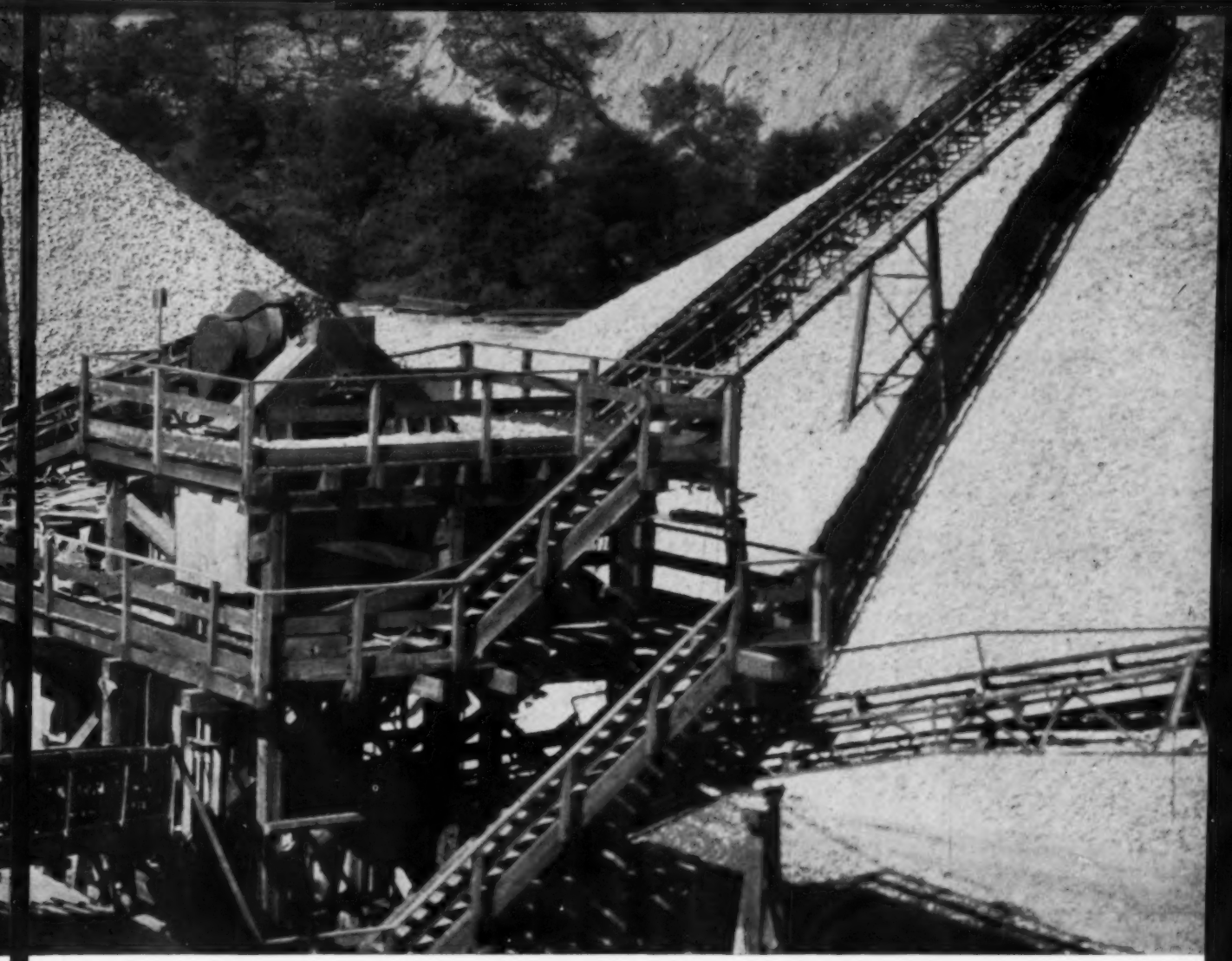
Texaco Simplified Lubrication Plan

Fewer lubricants means fewer storage, handling and inventory problems, plus complete lubrication protection.

In a big operation like this aggregate plant, Texaco's Simplified Lubrication Plan contributes to overall efficiency by assuring that you get the *right* lubricants for all major equipment. The Texaco Simplified Lubrication Plan developed for your operation may call for as few as 6 lubricants, yet they will handle all major lubrication . . . reduce storage problems, handling costs, and minimize the chance of using the wrong lubricant for the job. And the Texaco Lubrication Engineer will make sure that the lubricants you use are tailored to your operation. It all adds up to equipment that's more efficient—and systematic lubrication that's simple, time-saving and economical.

Here are some of the products that can handle

Exclusive P&H MAGNETORQUE® and ELECTRONIC CONTROLS



all your major lubricating problems:

Texaco Ursa Oil Heavy Duty, fully detergent and dispersive, to keep heavy duty gasoline and diesel engines clean and economical.

Texaco Marfak, has a wide temperature range, high resistance to shock loads, seals out dust and dirt, prevents rust.

Texaco Regal Oil R&O for air compressors and hydraulic systems, a high-grade lubricant fortified with rust and oxidation inhibitors; assures trouble-free operation.

Texaco Universal Gear Lubricant EP, assures long life for transmissions and differentials.

Texaco Track Roll Lubricant, specifically designed to protect rollers against rust and wear.

Texaco Rock Drill Lubricant EP for longer drill life and full protection against rust, whether drills are running or idle.

Your local Texaco Lubrication Engineer can give you complete details on the Simplified Lubrication Plan. Just call the nearest of the more than 2,000 Texaco Distributing Plants in the 48 States, or write:

The Texas Company, 135 East 42nd Street, New York 17, N. Y.

LUBRICATION IS A MAJOR FACTOR IN COST CONTROL

(PARTS, INVENTORY, PRODUCTION, DOWNTIME, MAINTENANCE)

Enter 14 on card, page 239

Exclusive P&H MAGNETORQUE® and ELECTRONIC CONTROLS put this 8 yd. P&H 1800 Electric Shovel far in front for economical, daily output in open pit mining operations.

For stripping, digging, loading P&H offers power cranes and shovels

This P&H 1055-LC is designed and balanced to handle extra long booms and larger dippers. It is performing long range mining operations at Flemington, W. Va., equipped with a 48-foot boom, 34-foot dipper stick and a 3 yd. dipper.

This 2½ yd. P&H 955A is stripping overburden near Clarksburg, West Virginia. It is equipped with *exclusive* P&H MAGNETORQUE® Electric Swing which provides smoother, faster swings—without friction—without wear.

With true, tractor-type crawlers and all-welded construction, this 1½ yd. P&H 655B withstands the repeated twists, stresses and shocks of day-long mining operations. It is a popular model for fast loading and dumping.

P&H serves all these open pit mining needs

in a wide range of capacities

P&H Independent Planetary Boom Hoist contributes to the efficient operation of this 20-ton P&H 255A-TC. Boom lowering is always done under power in handling materials at this mine siding in McDowell County, West Virginia.

THE P&H LINE:

Electric Excavators from 3½ through 10 cu. yd.
Power Excavators from ½ through 4 cu. yd.
Truck Cranes from 10 through 70-ton capacity

HARNISCHFEGER

Construction & Mining Division
Milwaukee 46, Wisconsin

Enter 16 on card, page 239

34-foot dipper stick and a 3 yd. dipper.

out friction—without wear.

loading and dumping.

Coal Chief scoops and dumps 100 tons a minute!

Four Boom Support Strands, each 3⅝" dia., support the huge boom which towers 160 feet above the ground. These Tiger Brand cables are designed for long service life.

USS American Tiger Brand Hoist Rope. Two of these 2⅝" dia. shovel hoist ropes supply the guts to lift the heaviest loads.

Rigged with USS American Tiger Brand Wire Rope

Here's the latest of the big diggers, the Coal Chief, built by Marion Power Shovel Company. It can scoop up 70 cubic yards at a bite, swing it approximately the length of a football field and dump it in piles more than 96 feet high. It makes the round trip in less than 60 seconds.

This strip mining operation is a joint venture between Simco Peabody Company and Columbus & Southern Power, Columbus, Ohio. All the coal produced will be furnished to the power company . . . about 8,000 tons a day.

The new shovel, like its two predecessors, is rigged throughout with USS* American Tiger Brand Wire Rope. The tremendous power of the shovel is handled by two hoist ropes 2⅝" diameter, and the gigantic boom is supported by four lengths each 105½ feet long, of 3⅝" diameter galvanized boom support strand. Each strand has a catalog strength of 768 tons, for a total of 3,072 tons.

Your equipment may not need such large wire rope, but the fact that all applications on this huge shovel are handled by standard USS American Tiger Brand* constructions emphasizes the quality of the engineering that goes into the complete line of Tiger Brand Wire Rope. For more information, write American Steel & Wire, Rockefeller Building, Cleveland 13, Ohio.

American Steel & Wire
Division of USS United States Steel

*TRADEMARK

Columbia-Geneva Steel Division, San Francisco, Pacific Coast Distributors • Tennessee Coal & Iron Division, Fairfield, Ala., Southern Distributors
United States Steel Export Company, Distributors Abroad

6,000 tons of overburden per hour can be stripped by this new 70-cubic-yard Marion shovel built for Simco Peabody Company and Columbus & Southern Power.

Enter 18 on card, page 239

(Above) Aggregate travels 800 feet on four 24" belts before it is loaded onto a 500' x 24" under-the-road conveyor belt.

Photos courtesy Barber-Greene Company, Aurora, Illinois

Hamilton Conveyor Belting

By pushing a button . . .

One man moves 75 million tons along Hamilton Rubber conveyor highway

The control tower operator of this mid-west sand and gravel company can start and regulate the movement of 75,000,000 tons of aggregate on 16 Barber-Greene conveyors, equipped with over 5,000 feet of Hamilton Belting, even to positioning and loading the barges!

One section of this conveyor system travels under a state highway. The need for expensive haulage equipment was eliminated because of this unique conveyor system; work stoppage totaled one week out of a full year—and then only because of sub-freezing weather.

Hamilton Conveyor Belting, installed on Barber-Greene materials handling equipment carries the aggregate from the pit to the surge pile. A tunnel conveyor under the surge pile delivers the aggregate to the screening plant. After processing, conveyors carry each type of material to its stock pile. Tunnel conveyors under the stock piles deliver single, or blended types of material to the barge loading conveyor.

Three ground men, under the direction of the tower operator, assist him in operating the plant. A drag line operator in the aggregate pit loads a feeder positioned over the first Hamilton Conveyor Belt. His oiler shares lubricating duties for the entire plant with the barge man. The barge man attaches the tag line to the barges, and operates the conveyor loading gates under the stock piles.

Only equipment of the greatest dependability and highest quality can serve an automated operation of this type. Hamilton Conveyor Belting was selected for the job because its dependability and fine quality has been proven on thousands of jobs under every conceivable working condition.

(Above) The 160' x 30" belt in foreground discharges material from upstream stock piles onto 470' x 30" belt which also withdraws material from downstream stock piles, and loads barge. (Upper Right) Aggregate is delivered to washing, crushing and screening plant via 185' x 24" tunnel conveyor belt from surge pile. Conveyors carry finished products to stock piles. The 470' x 30" belt, and a 250' x 30" belt run under the stock piles.

Maintenance cost about $100 for 600,000 tons hauled.

This included repairs on all haulage equipment! Hamilton can cut your conveyor belt maintenance costs to a similar low level through its marked superiority of materials and construction. The "Cushion Covers", for instance, are compounded to meet your job requirements; from heavy, jagged loads to light, abrasive materials. Heavy, reinforced edges are standard. A breaker fabric, for extra cushioning, can be included. Fabric plies are impregnated with rubber to add strength. Rubber skim coat, inserted between plies, acts as a resilient bed.

For more information write Hamilton, Dept. DD for our new Belt "Check-Up" Brochure.

Hamilton Rubber

MANUFACTURING CORPORATION, TRENTON 3, N. J.

A Division of Acme-Hamilton Manufacturing Corporation

ATLANTA • CHICAGO • HOUSTON • PITTSBURGH • INDIANAPOLIS • LOS ANGELES • NEW YORK • SAN FRANCISCO

(Above) 500' conveyor belt delivers aggregate to surge pile.

(CP) TRACDRIL

has 3 speed-up features

This new G-800 self-propelled Tracdril provides a completely mobile drill mounting . . . can be "spotted" into position with ease! It takes uneven ground in stride . . . tows its own compressor up steep grades. With feed motor moved to rear of drill carriage, toe-holes are started only 9″ from bottom. On top-holes, drill controls stay in easy reach.

Two heavy-duty deep-hole drills now available with standard-neutral-reverse rotation for use with coupled steel: CP-400DR, 4″ cylinder bore, 2½″ holes to 50 feet; and CP-450DR, 4½″ cylinder bore, 3″ holes to 75 feet. *Chicago Pneumatic Tool Co., 8 East 44th St., N. Y. 17, N. Y.*

1. Hydraulic sliding cone gives carriage additional lift for tramming over uneven terrain . . . firmly sets drill carriage stabilizing foot pad on ground.
2. Hydraulic positioner provides proper setting of the drill carriage angle — for left, right, forward and back positions.
3. Hydraulic controls elevate the U-arm with a finger touch . . . insure quicker drill carriage positioning.

Chicago Pneumatic

PNEUMATIC TOOLS • AIR COMPRESSORS • ELECTRIC TOOLS • DIESEL ENGINES • ROCK DRILLS • HYDRAULIC TOOLS • VACUUM PUMPS • AVIATION ACCESSORIES

News of the Industry

National Safety Council's Public Interest Award Won by Pit and Quarry

PIT AND QUARRY was among the winners of the National Safety Council's 1957 Public Interest Award in the specialized magazines category, an honor received several times in the past.

Recipients of the 1957 award included 29 specialized and 10 general circulation magazines, 40 daily and 18 weekly newspapers, 147 radio and 36 television stations, one television and two radio networks, four radio-TV syndicates, 10 general circulation magazines, 29 advertisers, and 57 outdoor advertising companies.

In announcing these winners, Ned H. Dearborn, president of the National Safety Council, said: "A review of these 1957 Public Interest Award entries shows beyond question the tremendous contribution of mass communication media to the sharp reduction in the number of traffic deaths last year."

Judges of the award, all specialists in the public information or safety field, were Hugh Curtis, editor, *Better Homes & Gardens;* Norman Damon, vice - president, Automotive Safety Foundation; Maxwell Fox of the Advertising Council; Frederick H. Garrigus, manager of organizational services, National Association of Broadcasters; Wesley I. Nunn, advertising manager, Standard Oil Company (Ind.); Dr. Kenneth E. Olson, Medill School of Journalism, Northwestern University; and John Osbon, Midwest news editor, *Broadcasting Magazine.*

Robert J. Hummel Retires From Consumers Co. Post

Retirement of Robert J. Hummel, vice-president and general manager, Illinois Division, Consumers Company, Chicago, was recently announced by Harry Clark, president of Consumers, a division of Vulcan Materials. Mr. Hummel had been directly concerned with operations during his 17 years with the firm.

Mr. Hummel is succeeded by Otto Cheska, vice-president, Wisconsin Division, who becomes general manager of operations in both states.

Coming Events

May 14-16, 1958—Hot Springs, Va. 23rd annual convention, National Industrial Sand Association. The Homestead.

June 22-27, 1958—Boston. 61st annual meeting and exhibit, American Society for Testing Materials. Hotel Statler.

July 21-22, 1958—Denver. Mid-year meeting, Expanded Clay and Shale Association. Cosmopolitan Hotel.

July 24-25, 1958—Hot Springs, Va. Directors meeting, National Crushed Stone Association. The Homestead.

September 22-25, 1958 — San Francisco. American Mining Congress, 1958 Mining Show; Metal Mining—Industrial Minerals. Civic Center Exhibit Hall and Civic Auditorium.

September 30-October 1-2, 1958 —Las Vegas, Nev. Semi-annual meetings, boards of directors of National Sand and Gravel Association and National Ready Mixed Concrete Association. Hotel Tropicana.

October 21-22, 1958—Washington, D.C. 4th annual meeting, National Slag Association. Mayflower Hotel.

Construction Under Way On New $12,000,000 Plant Of Ideal Cement Company

Ideal Cement Company, Denver, Colo., has begun construction of a $12,000,000 plant at Tijeras, 16 miles east of Albuquerque, N. M. The facility will be a single-kiln, dry-process installation having an annual capacity of 1,000,000 bbl. of cement.

The major contract was awarded to Robert E. McKee, General Contractors, Inc. Still to be awarded are contracts for the plant laboratory and the building to house the machine shop and storeroom.

The kiln will be 375 ft. long and have a slope of ⅜ in. per foot, the first 60 ft. at the feed end being 12 ft. in diameter and the remaining 325 ft. 11 ft. in diameter.

Construction on the office building and nine silos, 135 ft. high and 30 ft. in diameter, has already begun, and work on the plant proper is expected to begin shortly. To facilitate possible expansion, the plant is designed with provision for doubling capacity. Prestressed and precast concrete construction methods are being utilized.

Riverton Lime and Stone Co. Opens Two Crushing Plants

Two new stone-crushing plants of Riverton Lime and Stone Company, Riverton, Va., have begun operations that will increase more than two and one-half times the company's stone aggregate production.

The larger plant at Paris, Va., was acquired recently from Virginia Stone and Construction Company. Its capacity is 300,000 tons of crushed stone a year. The other plant, south of Amherst, Va., was completed early this year and has an annual capacity of 200,000 tons.

Riverton's chief executive officer, Jens C. Holm, stated that the expansion was carried out to supply road construction projects nearby.

Construction Contracts Drop 10% in February—Residential Totals Down

Contracts for future construction in the United States in February totaled $1,953,422,000, a 10 percent decrease from February, 1957, according to F. W. Dodge Corporation, construction news and marketing specialists. This marked the second consecutive month in which contracts registered a 10 percent decline.

Dollar volume of contracts in the residential category amounted to $727,282,000, down 17 percent from the like month of a year ago. The number of one- and two-family housing units was down sharply, but apartment units again registered an increase, this time 2 percent. The number of dwelling units of all types totaled 59,172, a drop of 14 percent, compared to February, 1957.

Contracts in the non-residential category in February totaled $750,819,000, a decrease of 8 percent. The decline was due primarily to decreases in contracts for manufacturing and commercial buildings; hospitals also showed a sharp decrease. However, contracts for educational and science buildings were up two percent.

Heavy engineering contracts in February totaled $475,321,000, a gain of 2 percent above February, 1957. A gain of 29 percent was reported in public works, but utility contracts dropped 38 percent.

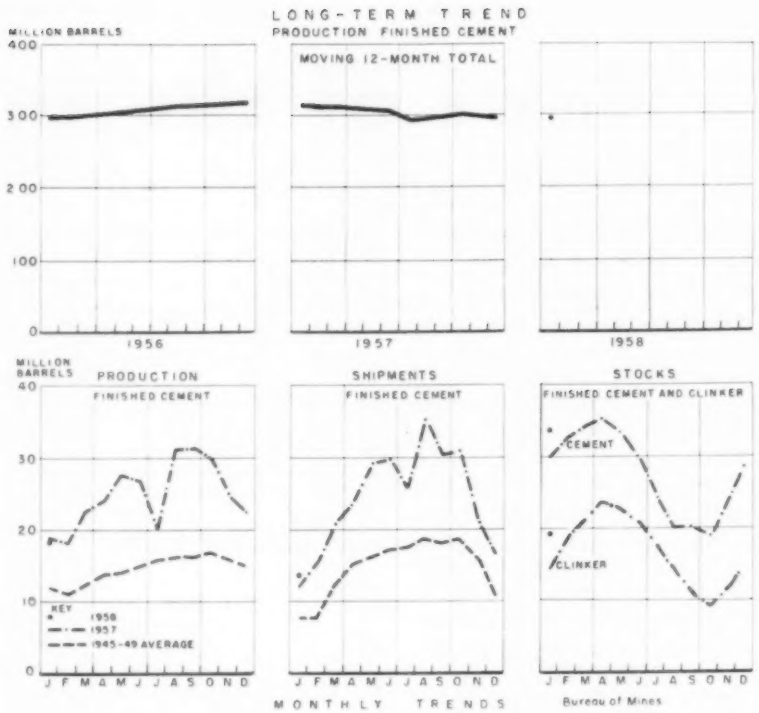
Increases in contracts for streets and highways and sewerage systems accounted for the public works gain; utilities were down because of decreases in contracts for water supply systems, airports, and other utilities.

The cumulative total of contracts for the first two months of 1958 amounted to $4,013,416,000, down 10 percent from the like period of 1957. Cumulative total of contracts in the major construction categories showed: non-residential at $1,507,111,000, down 13 percent; residential at $1,501,212,000, down 11 percent; and heavy engineering at $1,005,093,000, down three percent compared to the like 1957 period.

The 41st annual meeting of the National Slag Association will be held on October 21 and 22 in Washington, D. C. Hotel arrangements have been made with the Mayflower Hotel.

Winsal of Canada, Ltd., a subsidiary of Castrop-Rauxel of West Germany has purchased a total of 125,120 acres of potash subsurface withdrawals in the Melville and Yorkton districts in Saskatchewan.

The 1957 net income of Keystone Portland Cement Company, Philadelphia, Pa., was $2,110,449, slightly under the $2,170,075 figure in 1956.



SUMMARY—Production of finished portland cement in January, 1958, as reported to the U. S. Bureau of Mines, totaled 18,488,000 bbl., a decrease of 4 percent from January, 1957. Mill shipments in January, 1958, totaled 13,618,000 bbl. an increase of 15 percent compared with January, 1957. Stocks of 33,312,000 bbl. of finished portland cement on hand January 31, 1958, were 12 percent more than on the same date last year. Clinker production during January, 1958, totaled 23,057,000 bbl., a decrease of 6 percent from the January, 1957, figure.

PRODUCTION—One hundred and fifty-three (153) plants in 37 states and Puerto Rico reported a production of 18,488,000 bbl. of finished portland cement during January of 1958 compared with 19,320,000 bbl. in January, 1957.

Clinker production during the month of January, 1958, was 23,057,000 bbl. compared with 24,412,000 bbl. during the same month last year.

Production of high-early-strength portland cement in January, 1958, totaled 1,500,000 bbl., a 14 percent decrease from the January, 1957, production.

Prepared masonry cement production in January, 1958, of 694,000 bbl. decreased 28 percent from the January, 1957, production.

SHIPMENTS—Mill shipments of finished portland cement for January, 1958, totaled 13,618,000 bbl. compared to 11,802,000 bbl. in January, 1957.

In January, 1958, shipments were higher in seventeen (17) districts and lower in six (6) districts than in January, 1957. The greatest increases were in the Illinois and Indiana-Kentucky-Wisconsin districts. The greatest decreases were in the Virginia-South Carolina and Louisiana-Mississippi districts.

Mill shipments of high-early-strength portland cement in January, 1958, totaled 765,000 bbl., an increase of 5 percent over the 726,000 bbl. shipped in January, 1957.

Mill shipments of prepared masonry cement in January, 1958, totaled 609,000 bbl., an increase of 26 percent over the 485,000 bbl. shipped in January, 1957. Over half of these shipments were from mills in the northern states east of the Mississippi River. Prepared masonry cements are shown in 376-pound barrels although they are sold in barrels of varying weights.

STOCKS—Mill stocks of 33,312,000 bbl. of finished portland cement were on hand January 31, 1958, 12 percent more than the 29,828,000 bbl. on hand January 31, 1957. Stocks of clinker on hand January 31, 1958, totaled 18,982,000 bbl. an increase of 32 percent over the 14,337,000 bbl. on hand January 31, 1957.

MISCELLANEOUS—Total production during the 12 months ending January 31, 1958, was 296,969,000 bbl.

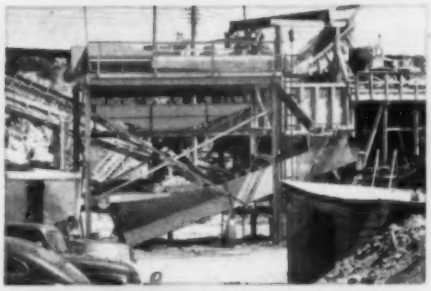
"We are very happy . . .

WITH OPERATION OF OUR EAGLE WASHING EQUIPMENT. MAKING MARKETABLE SPECIFICATION SAND ECONOMICALLY" Wm. Ross, Asst. Mgr., SUPERIOR STONE CO., Raleigh, N.C.

With only an Eagle single 24′ Water Scalping-Classifying Tank and a 44″ screw dia. x 32′ single screw Fine Material Washer Classifier-Dehydrator, the Belgrade Plant of Superior Stone Co. is turning out well over 800-tons per day of specification sand. Wm. Ross, Asst. Manager, in foreground below, and Worth Sellers, Process Engineer, Wearing skullguard, watching Eagle Tank in operation, praise the economical performance and efficiency of their Eagle Equipment.

If you produce concrete or bituminous aggregate now as never before you need the economy and dependability of Eagle Equipment—dependability based upon 86 years of experience.

SEND FOR NEW 48 PAGE CATALOG 58



SCREEN ANALYSIS

Screen Size	Feed	Product	Specification
⅜″	100%	100%	100%
#4	99	99.5	95-100
#8	90	88.5	80-100
#16	78	65.6	45-95
#30	63	48.7	25-75
#50	46	26.3	8-30
#100	14	4.6	.5-5
		FM 2.67	

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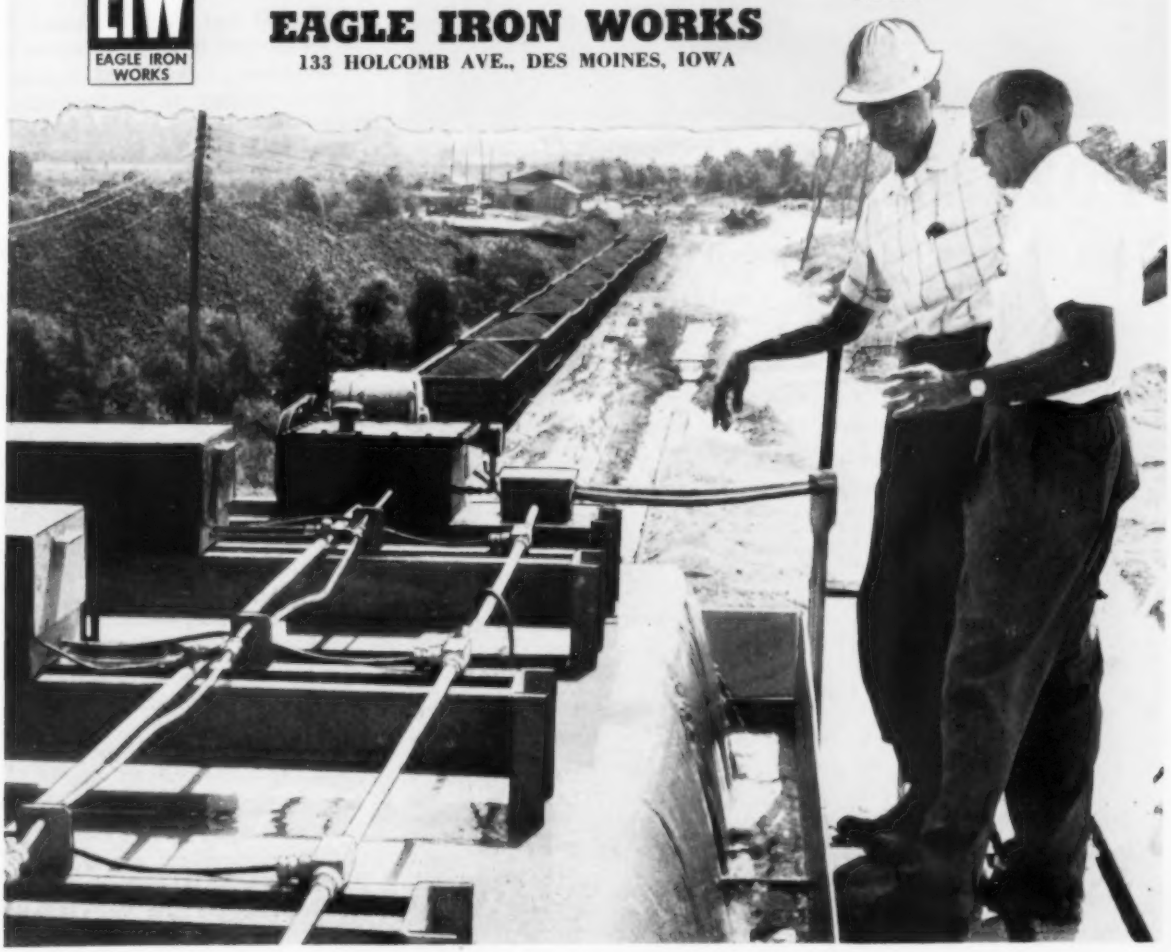


$1,000,000 Storage Facility Of N. Y. Cement Concern To Be Opened at Rochester

A new million-dollar cement storage and bagging plant which will double the amount of cement available in the Rochester (N. Y.) area has been opened by the Rochester Portland Cement Company.

Located on a three-acre site on the Genesee River, the plant has a 300-ft. loading dock, four 100- by 40-ft. silos, and a building for bagging the cement.

The first shipment of 3,000 tons of cement is expected early in May from the Lake Ontario Portland Cement Company, Ltd., in Picton, Ont., an affiliate of Rochester Portland Cement. Two shipments a week are planned, and officials of the firm expect that nearly 200,000 tons will be handled annually.

The Honeyman Brothers of Medford, Okla., have begun rock crushing operations on a farm owned by Darwin Barnes and near Caldwell, Kans. The hard stone has a limestone content of 86 percent.

PD20 Side Dump Trailers

boost production at Marquette Cement Co.

At Marquette Cement Co.'s Oglesby, Illinois plant, the big job of hauling overburden and rock is turned over to Athey PD20 Side Dumps. These PD20s dump on-the-go at the spoil bank and save time and maneuvering at the grizzly. Non-stop dumping trims 25 to 35 seconds off each cycle. The PD20s can move 30-ton loads at speeds up to 35.8 MPH. Hauling costs go down – man-hour-production goes up with the Athey PD20 on the job.

Athey also offers the PD15, a top performing Side Dump for use with the Caterpillar DW15 Tractor. To find out how an Athey-Cat Side Dump can cut costs in your pit or quarry, see your Athey-Caterpillar Dealer. He has all the answers to your hauling problems and can show you films of the PD20 in action. See him today! Athey Products Corporation, 5631 West 65th Street, Chicago 38, Illinois.

THE ONLY COMPLETE TRACTOR-TRAILER LINE . . . AND BY THE LEADERS

Athey

Enter 26 on card, page 239

Eagle-Picher to Process Diatomaceous Earth In $2,000,000 Facility

The Eagle-Picher Company, Joplin, Mo., is building a $2,000,000 diatomaceous earth processing plant with an annual capacity of 36,000 tons of natural and calcined filter aids at Lovelock, Nev.

Scheduled for completion in August, 1958, the plant was designed and is being built by Kaiser Engineers, Oakland, Calif. Machinery and equipment including a 9- by 120-ft. rotary kiln, blowers, cyclones, traps, and an air heater will be installed by Kaiser Engineers.

Prior to working on the plant, Kaiser Engineers also did the geological exploration on the Eagle-Picher diatomaceous earth open-pit mine site located about 25 miles from the plant now under construction. The mine will supply diatomaceous ore to the completed facility for processing.

28,000,000 Gal. of Petroleum To Be Stored in N. J. Caverns

Man-made underground storage caverns, claimed to be the country's largest, are being excavated below the Standard Oil Company's Bayway refinery, Linden, N. J.

When completed, the caverns will consist of two networks of honeycomb tunnels capable of storing more than 28,000,000 gal. of liquid petroleum gas. The first cavern, which will hold 300,000 bbl. of propane gas, is nearing completion. The second will contain 375,000 bbl. of butane gas.

Mined at a minimum depth of 300 ft. below the surface, the entire network will eventually total 6,000 linear ft. of tunnels, most of which will be 13 ft. wide and 22 ft. high. Approximately 134,000 cu. yd. of rock will be excavated to provide the necessary storage area.

Both parts are expected to be in use before the end of the year. These will be the first mined caverns for the storage of petroleum products on the East Coast.

The work of drilling and blasting passageways out of solid dark red shale began in October, 1956. Drilling operations included five shafts, each 42 in. in diameter, and 14 ventilating shafts, each 12 in. in diameter.

E. J. Campbell, Veteran Of Sand Industry, Dies After Colorful Career

Edward J. Campbell, former operator and owner of the Sun Sand Company, Thayer, W. Va., died recently at his home in Treasure Island, Fla., at the age of 86.

Mr. Campbell operated the sand business in Thayer for 35 years before retiring and moving to Florida in 1936. He was born in Texas, but began his business career in Utah. He also lived in Cripple Creek, Colo., where he was a newspaper editor for a number of years. While he was in Colorado, he also engaged in gold mining, and at the Cresson mine he discovered the "richest gold ore ever found in America."

He and his partner, Col. A. E. Humphreys, later developed wildcat oil wells. In 1921 they moved to West Virginia and formed the Sun Sand Co., a subsidiary of the Humphreys Gold Corporation of Jacksonville and Starke, Fla.

Mr. Campbell was a charter member of the National Industrial Sand Association. He was the great grand-nephew of Zachary Taylor, 12th president of the United States.

Marlon King Elected to Head Kentucky Crushed Stone Assn.

Marlon King of Canton, Ky., was elected president of the Kentucky Crushed Stone Association at its 15th annual meeting, which was held recently in Louisville.

Other officers elected were Richard E. Cooper, Somerset, vice-president; Miss Margaret McD. Smith, Lexington, treasurer; W. D. Milne, Louisville, secretary; and W. C. Snyder, Frankfort, executive secretary.

Members of the board of directors include Will E. Covington, Ashland; W. B. Paynter Jr., Middlesboro; Martin T. Smith, Frankfort; Norman Wiedmer, Hopkinsville; J. B. Allen, Winchester; Powell Potts, Franklin; and Sam Nally, Bardstown.

Television Aids Production At Lehigh Portland Cement

The Lehigh Portland Cement Company is maintaining even production at its plant at Union Bridge, Md., with a General Electric closed-circuit television system.

The camera lens is fixed on the bin which feeds stone to crushers. An operator in a remote location controls and maintains proper bin level *via* television. The result is a more efficient operation of the primary crusher, and a steadier flow of stone to the secondary crushers.

Gail Denny and Cloyd Simpson of Harrisburgh, Ill., have purchased Jesse L. Bean's limestone quarry at Elizabethtown, Ill. The quarry will be operated under a new lease arrangement with Rosiclare Lead and Fluorspar Mining Company, which has owned the quarry for 50 years.

Old Named Vice-President Of Southern Lightweight— Gibson, Ford Made Officers

A. F. Old was recently named vice-president of the Southern Lightweight Aggregate Corporation, Richmond, Va. Mr. Old was previously production manager of the Bremo and Leaksville (Va.) plants of the firm, which produce Solite lightweight aggregate.

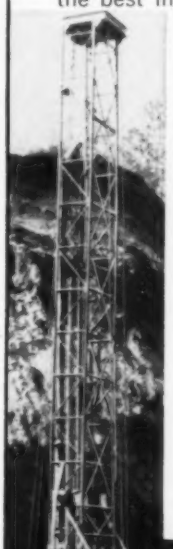
R. F. Gibson, who is in charge of the Aquadale plant of the Carolina Solite Corporation, and A. C. Ford, director of sales, were appointed officers of the corporation.

KEYSTONE-FRANKS ROTARY MOLE DRILLING MACHINE

Phone for a Demonstration

Telephone: Beaver Falls, Pa. 69, or Kearny, New Jersey, 2-2600

For 6 ½" blast holes, our experience indicates that we can drill them faster and at a lower cost because we have combined the best in applied drilling engineering.



- Gardner Denver AM6 Mole Dril
- Timken 6½" carbide insert bits
- International Harvester Truck
- Cummins Diesel Engine
- Gardner-Denver WBJ Compressor, 600 CFM at 100 PSI
- Keystone Franks Rotary Mole Drilling Machine

While we DEMONSTRATE what we can do, we cut your drilling costs at the same time. Phone or write us for a DEMONSTRATION on your quarry, mine, road or construction job.

GARDNER DENVER COMPANY

MOLE DRIL

DOWN THE HOLE GUN

with Timken threaded carbide insert rock bit

STARDRILL-KEYSTONE COMPANY

MAIN OFFICE: BEAVER FALLS, PA., TELEPHONE 69

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Enter 27 on card, page 239

Want a 50% production increase?

Not a normal assignment — this huge hunk of limestone was a challenge the D8 operator couldn't resist. With the No. 8U Bulldozer he moved it almost 100 yd., then pushed it into the pit. The stone probably weighed as much as the D8. This machine is part of a large Caterpillar-built fleet doing quarry work for Edward Kraemer & Sons, Inc. Get the same high production on your own operation by standardizing on the big yellow machines. On normal assignments or not, they take the hard work in stride and make it look easy.

Caterpillar pioneered the revolutionary "U"-shaped bulldozer, the No. 8U, for use on the Cat D8 Tractor and the No. 9U for the D9.

With a "U"-shaped 'dozer blade, you get the shearing action of an angling blade plus the rolling action of a straight blade. The shearing action of the wing digs into the material, forcing it to the center of the blade where a capacity load is carried the full length of the 'dozing pass. "U"-shaped 'dozers can carry tremendous loads with very little spillage around the sides or over the top—so every pass is a full pass, and every full pass is a profitable pass. In fact, tests have shown you can expect to increase 'dozing production as much as 50% when you replace your conventional bulldozer with a Caterpillar "U"-blade.

Hard to believe? Your Caterpillar Dealer will prove it for you, with your own rock, gravel or earth. Call him and arrange a no-holds-barred demonstration.

Caterpillar Tractor Co., Peoria, Illinois, U. S. A.

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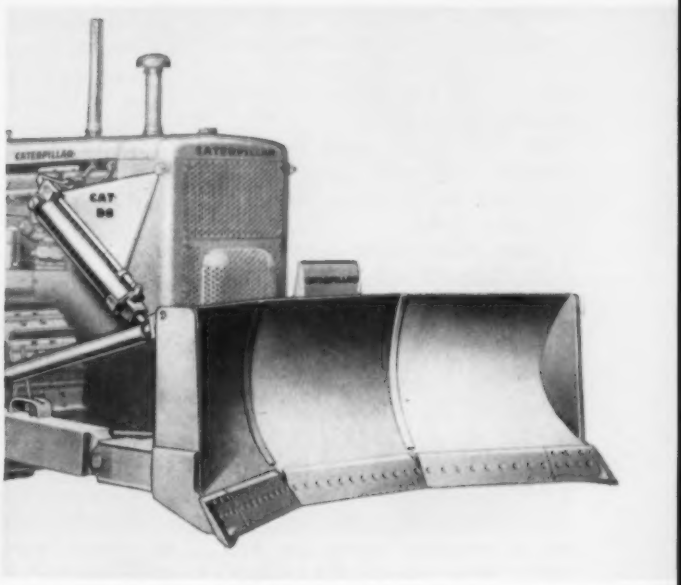
HIGH-PRODUCTION DOZING

Try a "U"-blade on your job!



"The hydraulic tilt cylinder on our D8's No. 8U Bulldozer makes loading much easier. By tilting the blade up and down while loading, it keeps the blade free and at the same time it loads the blade faster. It's handy for digging this tough clay. By using one corner, it breaks up the ground faster."—That's the on-the-job report of Vernon Hamburg, operator for Edward Kraemer & Sons, Inc., Plain, Wisconsin. Mr. Hamburg with his "U"-bladed D8 strips 900 to 1,000 yards of quarry overburden a day.

B. F. Martin

E. D. Hill

J. H. Mallon

H. Baker

H. Irick

Louisville Cement Company Elects President, Chairman, Fills Other Executive Posts

Boyce F. Martin has been named president and chief executive officer of the Louisville Cement Company, Louisville, Ky., succeeding Eugene D. Hill, who was elected chairman of the board.

Mr. Martin, who is also a director of the company, was formerly executive vice-president and treasurer. He has been with Louisville Cement since 1942.

Mr. Hill becomes chairman of the board after serving as president of the company since 1939, when he succeeded the late William S. Speed. Prior to that time he had held the positions of vice-president, director, and sales manager.

In other top executive changes John H. Mallon was elected to the new post of senior vice-president; Homer Baker was promoted from sales manager to vice-president; and Harold Irick was named treasurer, replacing Mr. Martin.

Mr. Mallon has spent his entire business career with Louisville Cement, and has served as vice-president since 1944.

Other officers of the company are R. L. Hartsock and David E. Willingham of Speed, Ind., vice-presidents; and Roland Whitney, Louisville, secretary.

Flintkote Co. Sets Record For Sales Total in 1957

The Flintkote Company, East Rutherford, N. J., and its subsidiaries achieved the highest sales record in company history last year, with a total volume of $116,249,878, compared with $113,655,116 in 1956. Net income was $7,049,848, equal to $3.83 a share, as against $7,134,112, or $4.16.

A federal income tax refund of $1,000,000 or 59 cents a share, and the earnings of the Kosmos Portland Cement Company, acquired August 22, are included in the 1957 net figures.

Pacific S.W. Mineral Meeting Attracts Large Attendance

Scores of persons engaged in various phases of metal and nonmetal mining in the western states converged on San Francisco on March 27, 28, and 29 to participate in the 1958 Pacific Southwest Mineral Industry Conference. The event was sponsored by the San Francisco section of the American Institute of Mining, Metallurgical and Petroleum Engineers. Co-sponsors included the Reno, Las Vegas, and Southern California sections. The general chairman was Fred Lohse, Kaiser Aluminum & Chemical Co.

Conference programs included about 40 papers covering the western minerals industry in general and specific ores and products in particular. Papers of special interest to the industrial minerals group covered research, mining methods, markets, resources, and processing of barite, potash, cement, stone, salt and talc. Among the speakers were: W. E. Moulton, Pacific Cement & Aggregates; Henry T. Mulryan, Sierra Talc & Clay Company; K. J. Berkaw, Great Lakes Carbon Corporation; and M. C. Sutton, Calaveras Cement Company.

Mr. Sutton's paper describing the attainment of automatic kiln control in cement burning (a major program feature), is covered at length in a separate article appearing in this issue.

Construction Activity Rises in March 1958— 1st Quarter Up from '57

The dollar value of new construction put in place rose as is usual in March, to approximately $3,400,000,000, bringing the first-quarter total to $9,700,000,000 — a little above the total for the first quarter of 1957, according to preliminary estimates prepared jointly by the U. S. Departments of Commerce and Labor. The physical volume of new construction for the first quarter, however, probably has not risen over the same period of last year.

The latest quarterly estimate reflects a 7 percent rise in public construction from the same quarter of 1957, due primarily to rising expenditures for public housing and highways. Private construction outlays in the first quarter of 1958 were unchanged from the comparable quarter of last year, with residential building accounting for the same proportion of the private total in both periods.

Texas Gulf Sulphur Company, New York, N. Y., reportedly the world's largest producer of sulphur, had net earnings of $17,557,369, equal to $1.75 per share, last year. Earnings in 1956 totaled $28,135,880, or $2.81 a share. Gross revenue from 1957 sales was $66,883,847, against $84,573,412 in 1956.

The preliminary report of Mexico Refractories Company, Mexico, Mo., showed 1957 net earnings of $2,495,000, equal to $2.90 a common share, compared with $2,550,000, or $2.96 a share in 1956. Net sales totaled $20,980,000 in 1957, as against $20,190,000 in 1956.

Wide Range of Products with TELSMITH Equipment

Lambert Bros.-Ralph E. Mills & Gorman, Inc. flexible crushed stone plant, Morgantown, W. Va., is producing 450-500 tons per hour of the following sizes —

for the U. S. Corps of Engineers' Sutton Dam and Hildebrand Dam: 6″ x 3″; 3″ x 1½″; 1½″ x ¾″; ¾″ x 4 mesh; and minus 4 mesh sand.

... in addition, a variety of sizes for black top plants, ready-mix concrete plants, building block plants, agricultural lime, and mine dust.

Plant was designed by Rish Equipment Company, Telsmith Distributor, Roanoke, Va., under supervision of Mr. W. S. Russell, Vice Pres.

Telsmith Equipment in this plant is listed below. Send for Bulletin 266.

▲ Telsmith 48-FC Gyrasphere Secondary Crusher

◀ Telsmith 42 x 48 Jaw Crusher and one of two Telsmith 48″ Heavy Duty Apron Feeders

▼ General view of plant which has six 5′ x 12′ Telsmith Vibro-King Screens

Q-37

SMITH ENGINEERING WORKS

504 E. CAPITOL DRIVE **MILWAUKEE 1, WISCONSIN**

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4th Joint Meeting Held By Texas Aggregates—Ready-Mix Associations

Two related state groups, the Texas Aggregates Association and the Texas Ready Mixed Concrete Association held their fourth Joint Annual Convention in Austin, April 11 and 12.

John H. Van Amburgh of Dallas, sales manager, Wesco Materials

John H. Van Amburgh

Corporation, was elected president of the Texas Aggregates Association. He replaced Allan F. Cunningham, F. M. Reeves and Sons, Inc., Odessa.

Dan R. Parker, vice-president of South End Building Materials Company, Houston, was elected president of the Texas Ready Mixed Concrete Association, succeeding Floyd J. Childs, Childs Ready Mixed Concrete Company, Abilene.

On April 11 the group devoted a full day to business and technical information, hearing addresses by Dr. John R. Stockton, director, Bureau of Business Research, University of Texas; Joseph E. Gray, engineering director, National Crushed Stone Association, Washington, D. C.; Charles E. Golson, industry specialist, Western Machinery Company, San Francisco; H. C. Pfannkuche, structural engineer, Portland Cement Association, Austin; W. W. Fowlkes, attorney, San Antonio; and Vincent P. Ahearn, executive secretary, National Sand and Gravel Association and National Ready Mixed Concrete Association, Washington, D. C.

Guest speaker at the Saturday luncheon was the Honorable Will Wilson, Attorney General of Texas.

Social activities included the presidents reception, a boat ride down the picturesque San Antonio River for a Mexican supper, an informal tea and style show, a visit to the Hall of Horns, and a hospitality hour, followed by the annual banquet, dancing, and floor show.

New officers elected for the Texas Aggregates Association include the following: John H. Van Amburgh, Dallas, president; L. Ed Lee, Corpus Christi, vice-president; and Robert G. Pyle, Dallas, secretary-treasurer; new directors named are John H. Langston, New Braunfels; George G. Smith, Houston; and L. P. Gilvin, Amarillo; carry-over directors include Allan F. Cunningham, Odessa; Grady O. Rogers, Austin; and D. C. Harper, Dallas.

Ray L. Cain was re-elected executive secretary by both groups, which have headquarters in Austin.

KENT VICKERY has joined Calaveras Cement Company as sales representative in Stanislaus, Merced, and Mariposa counties, with offices in Modesto, Calif.

Men of the Industry

WHEN Norman Ernest Kelb recently retired from a second term as president of the National Crushed Stone Association, he passed another milestone in a long period of service and affiliation with this industry.

His career started in 1913, when Mr. Kelb was employed by the France Stone Company in Toledo, Ohio—his birthplace. A few years later, he became engaged in operations and sales for the France Slag Company in Detroit, Mich.

After service with the U. S. Army in World War I, Mr. Kelb resumed his association with the France interests in Greencastle, Ind. Subsequently, he became secretary-treasurer and general manager of the Ohio and Indiana Stone Company, Greencastle, and held similar positions with the Erie Stone Company. During this period, he also served a term as president of the Indiana Crushed Stone Association.

Norman Ernest Kelb

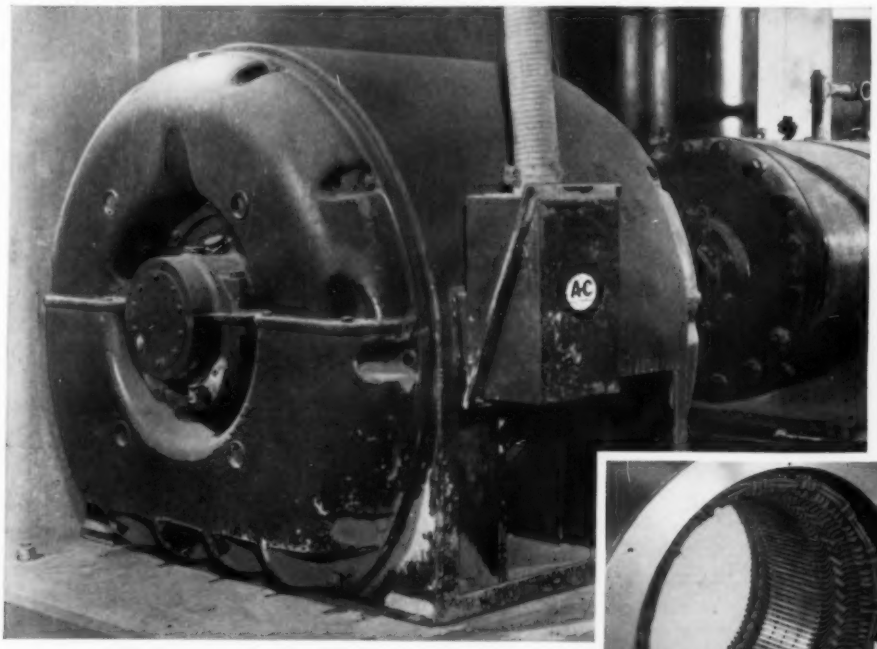
When Cumberland Quarries, Inc., was organized in 1941, Mr. Kelb was named president of that firm, a position which he still holds. In 1935 he was made a member of the board of directors of N.C.S.A.; in 1936 he became a regional vice-president; and two years later he was made a member of the association's executive committee.

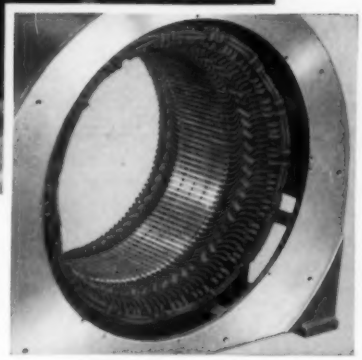
In 1946, Mr. Kelb returned to membership on the N.C.S.A. board of directors, and is currently active in that group. The years 1956 and 1957 witnessed his election and re-election as N.C.S.A. president—a post from which he retired only a few months ago.

In addition to his position with Cumberland Quarries, Mr. Kelb is president and a director of Ayrshire Collieries Corporation, vice-president and a director of Railway Service and Supply Corporation, a director of Republic Coal and Coke Company, a director of the National Coal Association, and a member of the Chamber of Commerce of Indianapolis, Ind., where he has resided since 1927.

Super-Seal...

motor with void-free insulation





The motor that dust and dirt can't hurt

Silco-Flex Insulation

Polyester Mica Tape

Asphaltum Mica Tape

Note difference in abrasion!
Insulation shown after sandblasting for one minute with 90-grit aluminum oxide and 100-psi air from distance of six inches.

REDUCE motor clean-up frequency and schedule this downtime at your convenience by using *Super-Seal* motors in areas where there's abrasive dust and clogging dirt. These motors —

Resist abrasion: Rubbery *Silco-Flex* insulation used in *Super-Seal* motors resists the cutting action of abrasive dust particles. Unlike conventional insulations, *Silco-Flex* insulation is flexible and resilient.

Completely sealed: *Super-Seal* motor insulation is sealed against contaminants. The vulcanized void-free dielectric barrier of *Silco-Flex* insulated stator coils even resists penetration by carbon black particles.

Combined with void-free *Silco-Flex* insulation are integrated mechanical features that make this motor especially suited to your toughest applications.

Get details! Call your nearby A-C office, or write Allis-Chalmers, Power Equipment Division, Milwaukee 1, Wisconsin.

Super-Seal and Silco-Flex are Allis-Chalmers trademarks.

ALLIS-CHALMERS

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Research-Cottrell

makes all three

All three Research-Cottrell dust collectors are engineered for specific cement dust applications. Research's experience as the world's largest manufacturer of precipitators is well known—over 2000 installations in many different industries • In addition to straight precipitators, Research-Cottrell also offers electrical-mechanical combination units and Cyclo-trell mechanical collectors. Cyclo-trells are available in both 10-inch and 24-inch tube sizes. For more information on Research-Cottrell's line of dust collecting equipment which has been engineered for the cement industry, write for Bulletin PC.

Research-Cottrell

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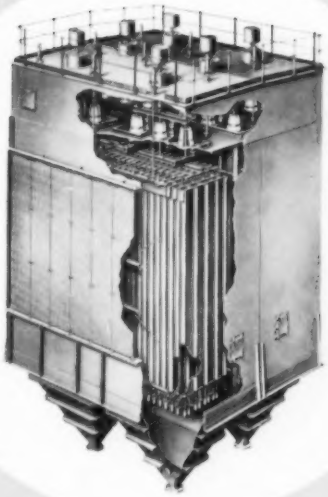
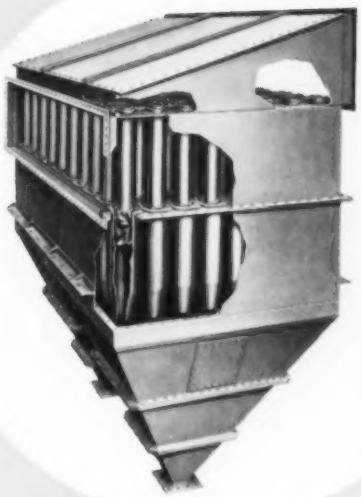
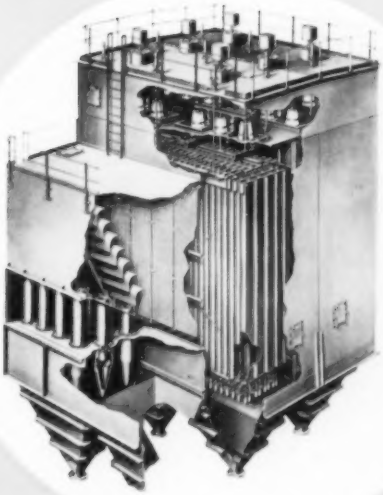


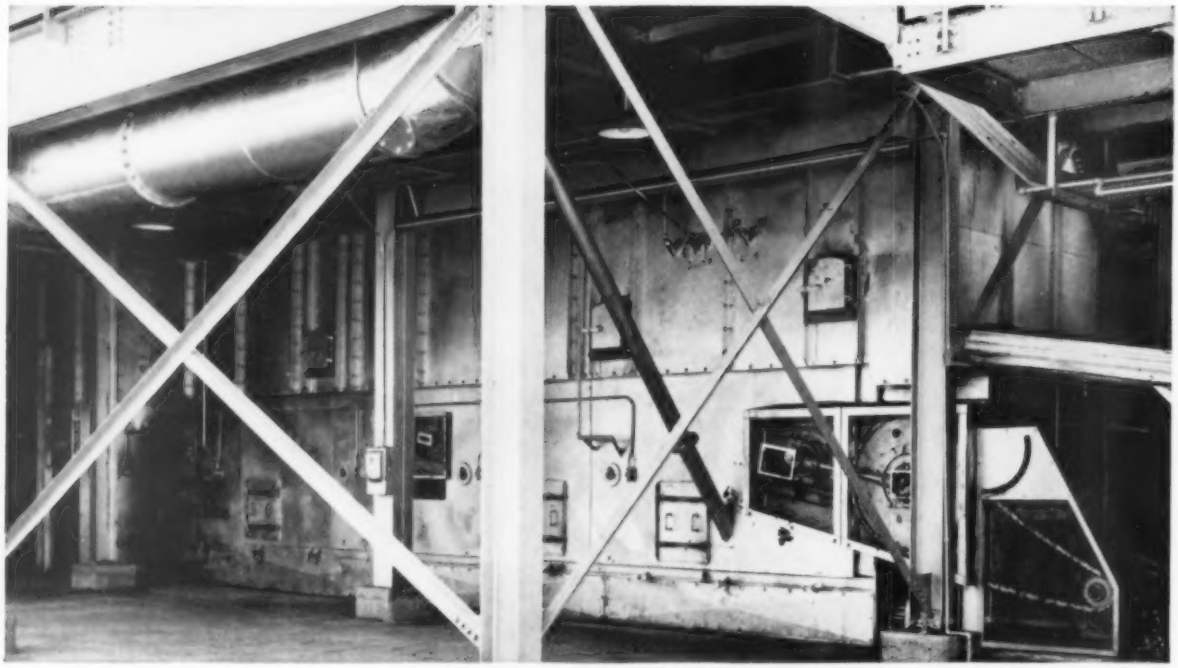
Cottrell
Precipitators



Cyclo-trell
Mechanical Collectors

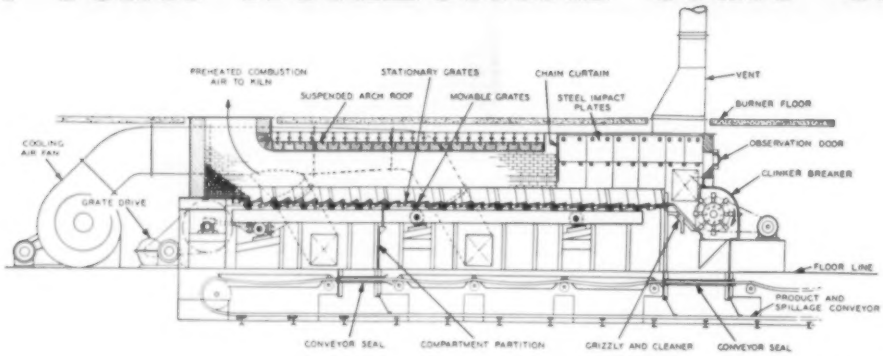


Combination
Electrical-Mechanical
Collectors



Side View from feed end of a 7' x 44' Horizontal-Grate Cooler, designed for cooling 4,000 barrels of Portland cement clinker per day, showing crank type grate drive

New Fuller HORIZONTAL-Grate Cooler



Cross-section drawing showing construction and arrangement of a typical Horizontal-Grate Cooler with clinker breaker.

Compact . . . Economical . . . Fast-cooling. Already proven in use, the compact, efficient design of Fuller's new Horizontal-Grate Cooler promises savings for many plants. It's an ideal choice where headroom is at a minimum . . . where a short, compact unit is desired.

Like the famous Fuller Inclined-Grate Cooler, the new Horizontal-Grate type is meeting with wide acceptance. One of the new units, already in operation, is shown above.

A Fuller Horizontal-Grate Cooler or an Inclined-Grate unit is the right answer to your cooling needs. Fuller coolers are used for a wide range of materials including lime, dolomite, cement clinker, iron nodules, phosphate nodules, sinter, ores, and others. Fuller sales engineers will be glad to discuss your cooling problems and make recommendations for your plant—without obligation, of course.

Features of the Fuller HORIZONTAL-Grate Cooler

- Requires a minimum of headroom
- Short length if necessary
- Better secondary air temperature control
- Less refractories
- Less installation time
- More rapid clinker distribution
- More uniform bed thickness
- Improved recuperation and cooling

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"See Chemical Engineering Catalog for details and specifications".

Gas Flow Study, Design Held Important Factors In Precipitator Efficiency

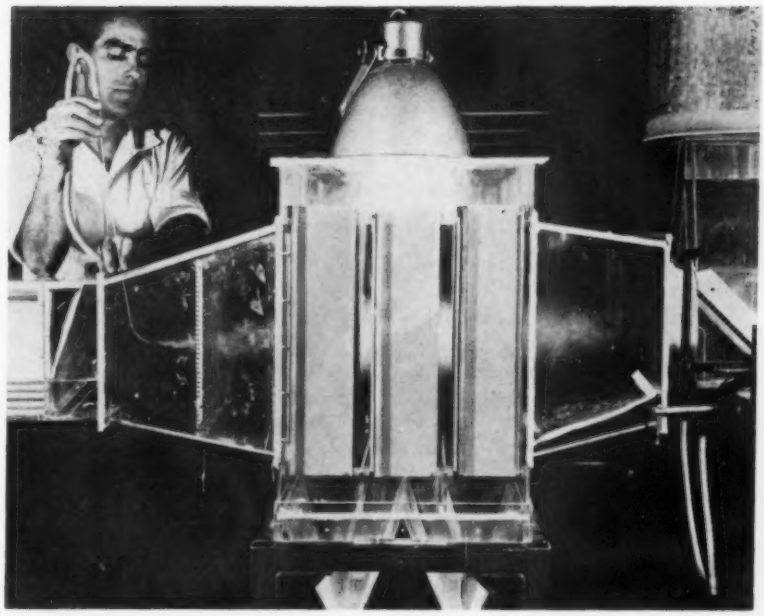
Keenly aware of the issue of air pollution, leaders of American industry spend millions of dollars annually to combat the problem. Equipment used in dust control includes primarily mechanical and cyclone-type collectors, and electrostatic precipitators.

With respect to the latter type, Dr. H. J. White, director of research and development, Research-Cottrell, indicated recently in speaking before a group of industrial publication editors, that improvement of gas flow can double the capacities of these units.

It was reported that studies on gas flow in ten models has already shown that the elimination of unbalanced flow, turbulence, eddies, and vortices in flues leading to precipitators can increase efficiency of the latter from 85 to 96 percent.

Engineers of Research-Cottrell believe that improved flue design will effect economies, and also that the best way to study such designs is through the use of scaled plastic models which aid observation of gas flow patterns. This opinion led to what is stated to be the first research program centered on working models ever undertaken by a precipitator manufacturer.

Among the results obtained thus far is the determination that it is possible to design flues that will reduce pressure loss from ¼ in. to over 1 in., w.g. In bringing gases to a precipitator in a more uniform manner, without turbulences, and evenly distributed over all the plates, two design approaches are made available—smaller units can be used to provide a given efficiency, and a larger volume of gas treated in a unit of given size.



This is a complete clear plastic working scale model of a precipitator, with which gas flow behavior and other phases can be studied. Included are: an air heater (left), an inlet flue, a precipitator with collection hoppers below, and an outlet flue to the stack.

It has also been found that correct flue design will often allow elimination of drop-out hoppers, with a consequent reduction of construction cost. In addition, it was learned that certain baffles in the precipitators themselves are actually unnecessary, a discovery which effects a further saving in unit cost, as well as decrease in pressure drop.

Analyses of cost of models built to date indicate that these expenditures are nominal in relation to the potential benefits accruing from the study of those units.

● This action shot at the Stoney Creek Stone Company's plant near Noblesville, Ind., shows a Clark Model 375-A Michigan tractor shovel dumping 6 cu. yd. of crushed limestone into a 23-ton semitrailer. Two such semitrailers can be loaded by the shovel in 6 minutes with 2½ passes each, or a total of 5 passes. Hydraulic controls permit the discharge of half-loads. The rear tires are hydroflated with calcium chloride solution, which acts as a counterweight. In emergencies, the 375-hp. vehicle, which has a speed up to 28 m.p.h., has been used to tow stalled equipment.

F. J. Buffington Retires From N. Y. Trap Rock—Kringel Named Successor

Floyd J. Buffington

John R. Kringel

Floyd J. Buffington, vice-president of production, retired on April 1 from the New York Trap Rock Corporation, New York, N.Y., after more than 22 years of service. Named as successor was John R. Kringel, who has been assistant vice-president since 1956.

Mr. Buffington received his bachelor of science degree in chemistry in 1914 from the University of Rochester. After serving as infantry sergeant against Pancho Villa's forces on the Mexican border and pursuit pilot with the rank of 1st lieutenant in World War I, he undertook several business ventures, all of which were fairly successful.

The supervision of construction in Maryland for W. P. Foss Jr. followed. Shortly afterward he became vice-president of the Hudson Brick Company, part of the W. P. Foss estate, in Washington, D. C. When the brick firm was sold to United Clay Products Company, Washington, D. C., in 1935, he became vice-president of the Core Joint Concrete Pipe Company in Irvington, N. J. On January 2, 1936, he joined New York Trap Rock as safety engineer.

John R. Kringel, newly-appointed successor to Mr. Buffington, studied mechanical engineering at the University of Colorado. A large portion of his engineering-construction career was spent in the Philippines, the Orient, and Central America.

After serving as commander of sub-chasers in the Atlantic during World War II, Mr. Kringel worked as a consultant to aggregate producers and ready-mixed concrete industries in several western states. He joined the Utah Construction Company and was assigned to design and construct an aggregate and concrete plant for an irrigation and hydro-electric project in Victoria, Australia. Upon completion of the project, he returned to become assistant to the vice-president of operations.

In January, 1954, he joined New York Trap Rock as superintendent of the plant in Haverstraw, N. Y. He was named assistant to the vice-president in 1955 and was promoted to assistant vice-president in 1956.

$600,000,000 Apportioned To States for Highways To Speed Up Construction

Secretary of Commerce Sinclair Weeks has apportioned to the states an additional $600,000,000 in federal aid for highways under the act signed April 16 by President Eisenhower. The $600,000,000, immediately available to the states, is in addition to the $2,875,000,000 previously apportioned for the fiscal year beginning July 1, 1958, under the Federal-Aid Highway Act of 1956.

Included in the new apportionment is $400,000,000 for use on the 737,000 miles of the Federal-Aid primary and secondary highway systems and their urban extensions. This amount was provided for the purpose of immediate acceleration of the rate of highway construction on these systems, with a consequent increase in employment.

The 1958 Act permits the use of the $400,000,000 without any fixed limitation as to the amounts to be spent on primary, secondary, and urban roads and streets. Moreover, the funds are provided on a two-thirds federal, one-third state matching basis. In addition, the new act permits the states to obtain from the Federal Government up to two-thirds of their matching share, as an advance to be deducted from future federal-aid apportionments.

Construction projects in which these funds are used must be placed under contract or have work started before December 1, 1958, with completion scheduled before December 1, 1959.

The apportionment also allocates to the states $200,000,000 for the 41,000-mile National System of Interstate and Defense Highways. This sum is in addition to the $2,000,000,000 already apportioned on August 1, 1957, for the fiscal year beginning July 1, 1958.

The additional $200,000,000 now provided will permit acceleration of the program. Federal aid for the Interstate System is matched on a 90-percent federal, 10-percent state basis.

German Efficiency Applied In Colorful Routing

What will those Germans think of next? According to *The Dragon,* house organ of the Dragon Cement Company, they are going all out for technicolor—even in highway construction.

Says the *Dragon:* "A plan is being tried out in West Germany to enable drivers to find their way more easily through and around large cities. Color will be mixed into the concrete just before it is poured."

Enter 39 on card, page 239 ➔

Euclid Rear-Dumps give you bonus benefits

For 25 years Euclid has specialized in designing and building equipment for heavy, off-highway earthmoving. The dependable low cost performance of these "Eucs" has made them the standard of comparison for contractors, mines and quarries around the world. About 7 of every 10 off-highway Rear-Dumps are Euclids.

Although this unmatched experience may not be apparent when comparing specifications, it assures bonus benefits for Euclid owners—cost-cutting advantages not provided by comparable equipment. The greater use of Euclids results in faster complete field exposure to operating and maintenance characteristics under all conditions. It assures advanced design that pays off in more work-ability and minimum downtime on the job.

With Euclid's larger machine population, it's economically possible for Euclid dealers to provide more complete service facilities and ready availability of all factory engineered replacement parts. It's factors like these that enable owners to keep their "Eucs" operating at peak efficiency with unusually high availability and low production cost.

When you're considering Rear-Dumps, get facts and figures from your Euclid dealer—have him show you why ***Euclids are your best investment.***

EUCLID DIVISION GENERAL MOTORS CORPORATION, Cleveland 17, Ohio

Your Euclid Dealer offers the best equipment investment

GM GENERAL MOTORS EUCLID

EUCLID EQUIPMENT

FOR MOVING EARTH, ROCK, COAL AND ORE

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Ideal's Limestone Quarry On Texada Island, B. C. To Open This Summer

A limestone quarry will soon be opened by the Ideal Cement Company on Texada Island in British Columbia, Canada, as a new venture. Certain equipment and the crushed stone business of W. S. Beale, Ltd., of Vancouver, B. C., will be purchased. By the middle of this year the quarry and crushing plant should be in operation on the island and shipments of stone will begin.

The operation will be known as the Rock Products Division of the Ideal Cement Company Ltd. W. S. Beale will be manager under the direction of Gordon Tongue, vice-president of Ideal's Northwestern Division.

U. S. Nonmetallic Producers Report Earnings for 1957

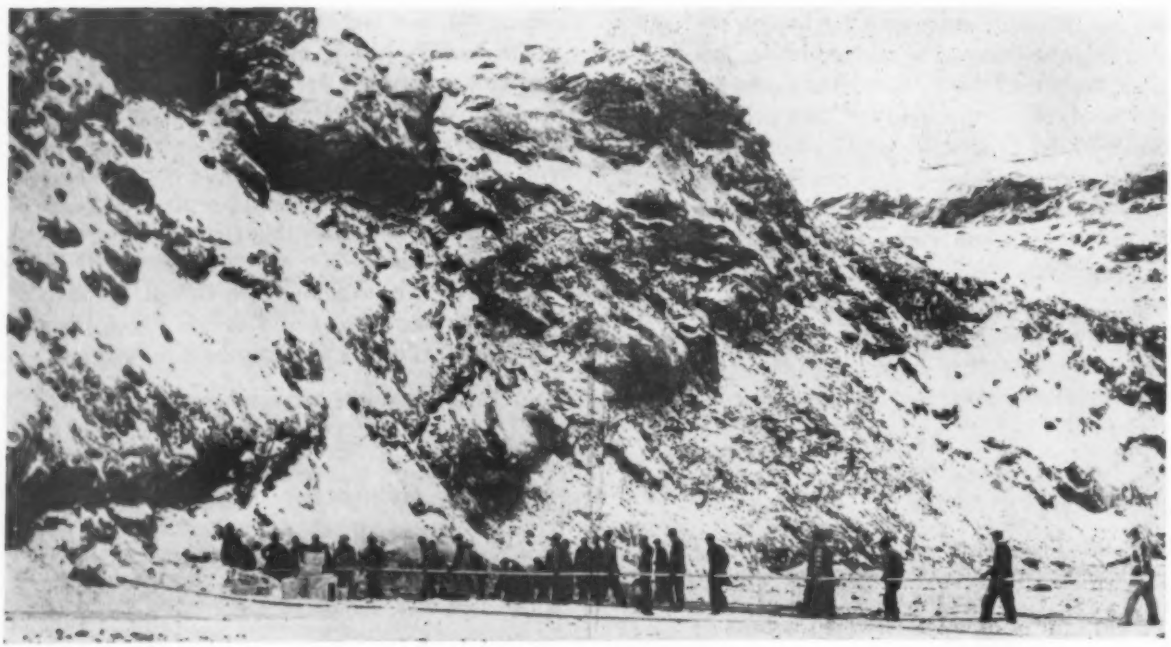
Net income of the Ideal Cement Company, Denver, Colo., totaled $14,479,434 or $4.15 per share for the year ended December 31, 1957, compared with the previous year's $14,920,021 or $4.32 a share. Net sales for 1957 and 1956 were $78,-254,763 and $77,693,240.

Sales of the Johns-Manville Corporation, New York, N. Y., in 1957 came close to record levels in 1956, but net income declined by more than 28 percent. Sales were $308,-300,000 against the peak figure of $310,400,000 in 1956. Net income was $17,782,000 against $25,003,-000 in the prior year.

United States Borax & Chemical Corporation reported net income of $5,470,931 for the fiscal year ended September 30, 1957. The company was formed by the merger of U.S. Potash Co. and Pacific Borax Co.

Michigan Chemical Corporation, Saint Louis, Mich., reported net sales of $9,571,000 for 1957, an increase of 44 percent over 1956 sales which were $6,641,000. Net income was $753,000 as compared to $356,000 in 1956.

• One of the largest blasts in the history of Nova Scotia was recently detonated in the National Gypsum Company's quarry at Milford in that Canadian province. Nearly 400,000 tons of high-grade gypsum was brought down from a 380-ft. face in the one shot. Preparation for the blast required drilling horizontally into the face, due to the irregular upper surface of the deposit. As shown in the photograph below, tamping of the 1,500 lb. of Forcite into each of the 74 holes was handled by 25 quarrymen, working with a 141-ft. tamping rod. Detonated with millisecond-delay caps, the blast brought down sufficient material to satisfy demands for a four-month period, according to E. D. Brown, vice- president of the firm.



$45,000,000 Kaiser Center To Be New Headquarters Of Kaiser Industries Corp.

A $45,000,000 Kaiser Center, world headquarters of the Kaiser Industries Corporation, is to be built on a seven-acre site overlooking Lake Merritt in downtown Oakland, Calif. It will be the largest office building west of the Rocky Mountains, according to Kaiser spokesmen.

The office building, rising 390 ft. above street level, will provide executive and general staff offices for Kaiser Industries and its more than 50 affiliated companies, including Permanente Cement, Kaiser Gypsum, and Kaiser Sand and Gravel. Approximately 3,000 Kaiser employees will be housed in the building. Total capacity will be 4,500 persons; gross area will be 976,000 sq. ft.

Scheduled for completion in late 1959, Kaiser Center will consist of the 28-story gold and gray office building, a shopping center, a five-level, 1,200-car capacity parking structure, and a four-acre roof garden.

Third Kiln Scheduled For Pakistan Cement Plant

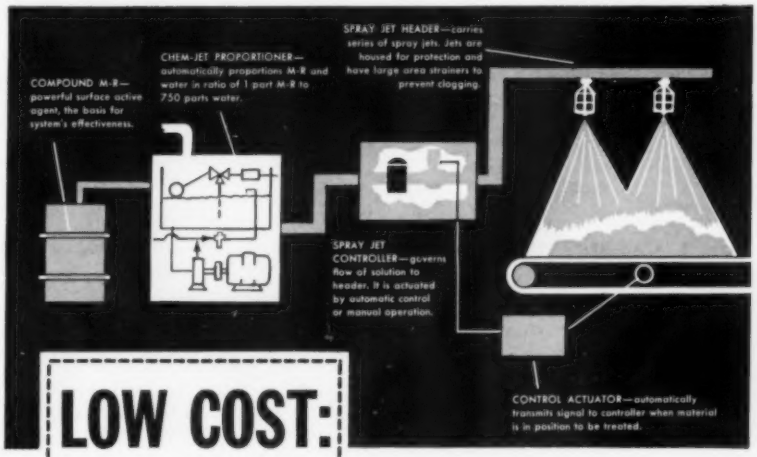
An agreement for the installation of a third kiln at the Zeal-Pak cement plant in Hyderabad has been completed by the Pakistan Industrial Development Corporation and F. L. Smidth of Denmark.

The new kiln, scheduled to go into production in 1959, will increase the present annual plant capacity of 240,000 tons to 360,000 tons. Under the terms of the agreement, heavy equipment will be manufactured for the first time at the corporation's shipyard and engineering works at Karachi.

Last year F. L. Smidth supplied the machinery and supervised the construction of the Zeal-Pak plant.

Medusa Portland Cement Company's net sales were $29,436,000 for 1957, off slightly from the record $29,768,000 the year before. Net profit, third-best in its history, declined to $3,960,000, or $4.75 a common share, compared with $4,799,000, or $5.75 a share, in 1956.

JOHNSON MARCH ► chem-jet DUST CONTROL SYSTEM


COMPOUND M-R—powerful surface active agent, the basis for system's effectiveness.
CHEM-JET PROPORTIONER—automatically proportions M-R and water in ratio of 1 part M-R to 750 parts water.
SPRAY JET HEADER—carries series of spray jets. Jets are housed for protection and have large area strainers to prevent clogging.
SPRAY JET CONTROLLER—governs flow of solution to header. It is actuated by automatic control or manual operation.
CONTROL ACTUATOR—automatically transmits signal to controller when material is in position to be treated.

LOW COST:
Investment
Operation
Maintenance

typical users of Chem-jet Dust Control Systems:

- General Crushed Stone Co.
- Lambert Brothers Quarries
- Marquette Cement Co.
- Nello-Teer Co.
- Penn-Dixie Cement Co.

THIS is what makes Chem-jet Dust Control different from any other system:

Chem-jet solves your dust problem by preventing dust! It attacks dust at its source, allaying dust before it becomes airborne.

Chem-jet treats dust bearing materials with Compound M-R, an extremely powerful surface active agent developed by Johnson-March chemists. M-R confines and agglomerates dust, with as little as ½ to 1% moisture per ton of material.

Chem-jet saves you money through low cost installation, minimum maintenance, economical operation. It eliminates bulky hoods, ducts, fans, plus the extra trouble of collecting and disposing of dust.

Where dust is a community nuisance and an employee hazard, it will pay you to investigate low cost Chem-jet. Write today for Booklet CJ-1 to Johnson-March, 1724 Chestnut St., Philadelphia 3, Pa.

JOHNSON MARCH
DUST CONTROL ENGINEERS
1724 Chestnut Street, Philadelphia 3, Pa.

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"TAKE IT FROM ME...

International® crawler is 'toughest', faster...for manganese mining!"

BRYON J. PHEGLEY, Superintendent, Duncan Mining Company

The authority of long experience with other leading makes of track-type tractors, backs the statement by Bryon J. Phegley, superintendent for Duncan Mining Company, Mena, Arkansas.

"I have been mining for 28 years," states Mr. Phegley, "but I don't know of any rougher tractor work than this. The International tractor is toughest and much faster than others I've used. It gives very good service."

Blasting brings down boulders that stump the ¾ cu yd shovel and block the haulers. The boss simply calls in their dozer-equipped TD-18. And in 15 minutes, or so, the pit face is clean, the haul road clear, so manganese ore mining can be resumed.

Rock-shock imposes tremendous impact loads on track frames. That's where box-section track frames, inside braced with inch-thick steel prove their stuff!

Powdery grit particles, as abrasive as grinding compound, gnaw at track parts. Electronic hardening puts a deep wear-fighting armor on track links. International track roller seals do a positive job of excluding grit from bearings—besides extending lubrication intervals up to 50 days!

Features like these are why the International crawler gives amazingly dependable performance—handling key jobs that help the mine profitably produce 1,000 tons of manganese ore per week!

For your own profit and satisfaction, discover why so many quarry-men and miners are switching to International crawlers — especially for the tough jobs like rock-moving. See your International Construction Equipment Distributor for a demonstration!

After pit clean-up, the International crawler resumes moving truck-hauled overburden out of the way. In addition to these jobs, the big crawler maintains haul roads.

Typical extra assignment for the International crawler: carving out a new haul road into the pit to reach a new vein of manganese 30 ft. below the level of the present pit floor. This road is to be 225 ft. long, 30 ft. deep, and 30 ft. wide.

International® Construction Equipment

International Harvester Co.,
180 North Michigan Ave., Chicago 1, Ill.

A COMPLETE POWER PACKAGE:
Crawler and Wheel Tractors . . . Self-Propelled Scrapers . . . Crawler and Rubber-Tired Loaders . . . Off-Highway Haulers . . . Diesel and Carbureted Engines . . . Motor Trucks . . . Farm Tractors and Equipment.

President's Conference

Afternoon workshops on March

Specification Aggregates

One of Duncan Mining's toughest jobs is clean-up after blasting. Their International crawler easily muscles the king-size boulders and chunks of shale from the pit to overburden dump.

Enter 42 on card, page 239

CHEMICO VENTURI SCRUBS

President's Conference On Occupational Safety Includes Mining Industry

The mining industry was represented for the first time at the sixth President's Conference on Occupational Safety, held in Washington, D. C., March 25, 26, and 27.

There were no separate meetings of a mining division at the conference. Industry representatives agreed to a safety approach along broad lines, common to all segments of the nation's economy.

Afternoon workshops on March 26 covered "Expanding Safety Activities Through Organizations," a study in multiplying safety efforts.

The five members of the technical advisory committee representing various aspects of the mining industry are Harry Gandy Jr., the National Coal Association; George W. Sall, the American Mining Congress; Charles Ferguson, the United Mine Workers of America; Harold J. Sloman, the Bureau of Mines, U. S. Department of the Interior; and Dr. William P. Yant, the Mine Safety Appliances Company.

More GIANT Sizes! More GIANT Tread Designs! More GIANT Savings! . . . Now at

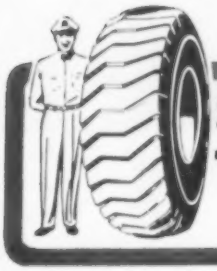
SOUTHERN TIRE COMPANY

Probably more dirt and rock is hauled on Southern Tire retreads than on any other retreaded tires. That's because more and more contractors and heavy equipment operators are discovering the superior quality and economy of Southern Tire retreads.

Southern Tire offers not only the country's most complete range of tire sizes and tread designs, but also the world's finest retreading facilities — three-sectional molds that mean no buffing to breaker strips regardless of growth.

These facilities and use of finest tread rubber, plus Southern Tire's long experience, assure better quality with greater economy. Call your tire dealer now for facts about how Southern Tire retreads can save you as much as 40% of the price of new tires yet give you guaranteed new tire service.

All sizes — from 1100 x 24 to 33.5 x 33



SOUTHERN TIRE COMPANY

1414 Broadway
SHEFFIELD, ALA.

Phone Collect
EV 3-2312

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Specification Aggregates For I.C.B.M. Launching Base Supplied by S.P. Milling

The once semi-isolated community of Lompoc, Calif., is now teeming with activity. The Army's old Camp Cooke nearby is being reactivated by the Air Force as an I.C.B.M. launching base, and more than $15 million is being expended in new construction to prepare the 67,000-acre site.

Missile-launching pads at this location are of extra-heavy reinforced concrete construction, each containing about 4,000 cu. yd. of special Class "A" concrete, with minimum strength of 3,000 p.s.i. at 28 days.

Rigid specifications for the aggregates are being met by the Sisquoc plant of the Southern Pacific Milling Company, where a heavy-media separation department was put into operation a year or so ago to upgrade the coarse aggregates. Recently a Wemco Remer jig was also added to beneficiate sand.

Concrete for the launching pads and other installations is being prepared by Southern Pacific Milling in a Johnson batch plant erected on the project. It is capable of batching 120 cu. yd. hourly. Mixing and delivery are handled by a fleet of 15 truck-mixers, ten of which are 7-cu.-yd. Challenge units.

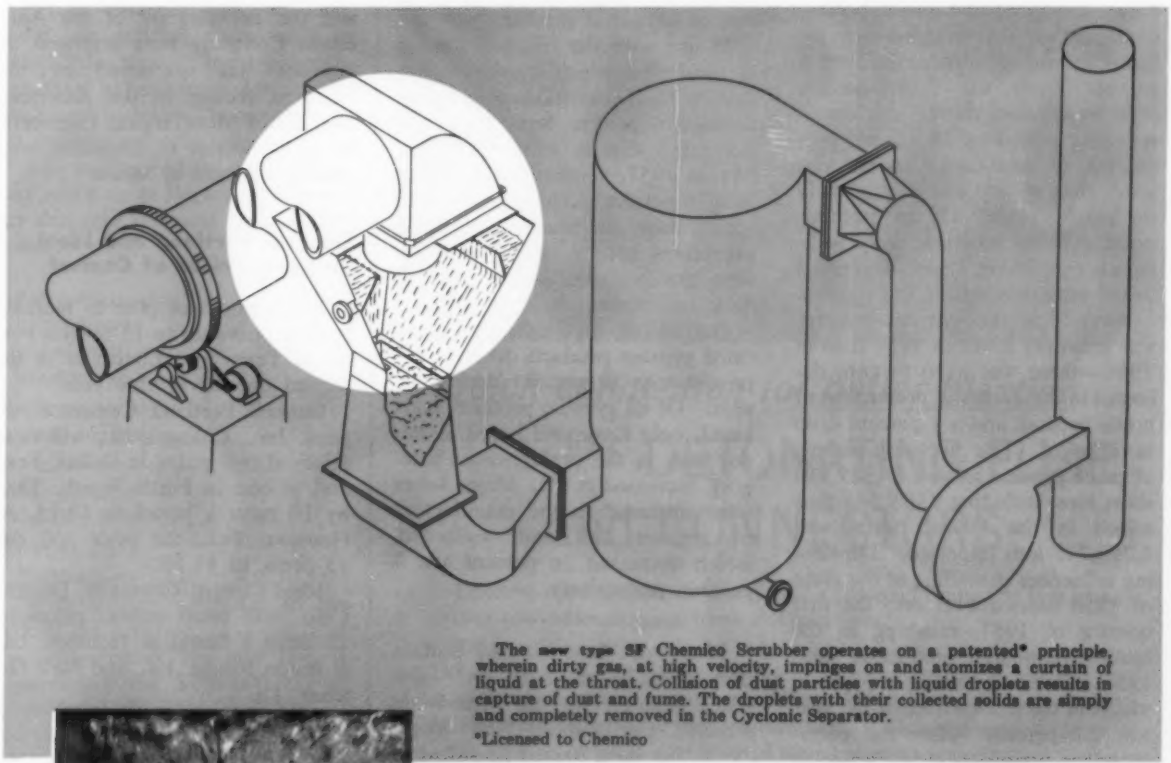
Southern Pacific Milling is now erecting a new sand-and-gravel plant at El Rio, near Ventura, Calif. Beneficiation equipment being installed includes both a Wemco H.M.S. plant in the final processing circuit, and Blaw-Knox "bounce plates, following the primary crusher.

Net sales of the Whitehall Cement Manufacturing Company, Philadelphia, Pa., were $8,783,186 and net income was $1,179,914, or $5.38 per share, for the year ended December 31, 1957. Comparable 1956 totals are $8,347,796 and $1,245,714, or $5.68 per share.

Sales of $17,079,341 and net income of $2,690,540, or $4,13 per share, were reported by North American Cement Corp., New York, N. Y., for 1957. In 1956 sales were $17,543,654, and income $2,617,687, or $4.01 a share.

CHEMICO VENTURI SCRUBS LIME KILN GASES WITH SLURRY CONTAINING 45% SOLIDS!

99% Scrubbing efficiency! Maintenance-free operation!



The new type SF Chemico Scrubber operates on a patented* principle, wherein dirty gas, at high velocity, impinges on and atomizes a curtain of liquid at the throat. Collision of dust particles with liquid droplets results in capture of dust and fume. The droplets with their collected solids are simply and completely removed in the Cyclonic Separator.

*Licensed to Chemico

Actual photograph of throat action

The new type SF CHEMICO Venturi Scrubber is handling 40,000 cfm of hot gases from a 8½′x 250′ rotary kiln at the Hudson Pulp & Paper Corporation and achieving over 99% removal of lime! This **new type SF** unit was developed to facilitate handling of scrubbing liquids containing large lumps, heavy solid concentrations or solutions likely to scale heavily, and utilizes large open weir troughs to distribute the liquid. It has no small passages subject to plugging by either gas or liquid.

Proof of the effectiveness of this new design is the fact that, despite the use of a recycled slurry containing over 45% solids and many large lumps, the Hudson operators report that no maintenance difficulties have been experienced and that the unit is virtually "trouble-free."

The **Chemico type SF** Venturi Scrubbers are low cost, compact and readily installed in your plant. Your inquiry will receive prompt attention from Chemico's Scrubber Department.

CHEMICO

CHEMICAL CONSTRUCTION CORPORATION

525 West 43rd Street, New York 36, New York LOngacre 4-9400

Gypsum Output in 1957 10% Lower Than in '56—4th Quarter Dips Slightly

Domestic mine production of crude gypsum in the fourth quarter of 1957, according to reports from producers to the U. S. Bureau of Mines was 1 percent below the fourth quarter of 1956. Imports increased 6 percent. The apparent supply of crude gypsum for the quarter totaled 3,299,603 short tons, including 2,238,385 tons mined and 1,061,218 tons imported. Consumption of portland-cement retarder during the quarter declined 5 percent from the fourth-quarter high established during the corresponding period of 1956, and production of base-coat plasters was lower than in any fourth quarter in the last 12 years. Of the prefabricated gypsum products, only wallboard, sheathing, and laminated board increased during the quarter.

Activity in the gypsum industry was generally lower in 1957 than in 1956—there was a 10 percent decrease in the domestic production of crude gypsum and a 1 percent drop in imports. The apparent supply of crude gypsum totaled 13,329,119 short tons, including 9,029,344 tons mined in the United States and 4,299,775 tons imported. Depressing influences prevailing at the close of 1956 carried over into the first quarter of 1957, resulting in the lowest first-quarter production since 1954. Domestic mining of gypsum, which in the first quarter of the year was 23 percent below the corresponding period of 1956, began to rise during the second quarter, continued upward during the third, but dropped in the fourth quarter period, and as a result the year-end total was 10 percent below 1956.

Uncalcined-gypsum products sold or used by producers during the year totaled 3,091,137 tons, against 3,357,277 tons in 1956, a decrease of 8 percent. Of the 1957 total, by far the largest share, 74 percent, was used in portland cement.

Calcined-gypsum production dropped 9 percent to 7,761,566 tons, of which 4 percent was consumed as plasters in the manufacture of industrial products.

In line with the reduced volume of residential construction, plasters sold or used for building purposes declined 6 percent from a total of 2,895,385 tons in 1956 to 2,713,241 in 1957, primarily as a result of a 10 percent decrease in the output of base-coat plasters. Notable exceptions to this general decline were the increases in use of roof-deck and "other" building plasters.

Output of high-value prefabricated gypsum products declined approximately 10 percent during the year. Of all gypsum products marketed, only laminated board, a minor item in the prefabricated category, increased in use. Major losses were sustained in the manufacture of gypsum lath and wallboard, which decreased 16 percent and 7 percent, respectively.

HARRY D. SIMONTON, Buffalo district traffic manager and sales office manager for the Penn-Dixie Cement Corporation, New York, N. Y. has been elected president of the Niagara Frontier Industrial Traffic League.

Montana School of Mines Holds Stope-Fill Symposium Featuring Slurry Handling

The Montana School of Mines held a stope-fill symposium on May 9 and 10 in Butte. A considerable portion of the meeting covered the theoretical and practical aspects of handling slurries in piplines.

Eleven papers, including one on the transportation of slurries in pipelines, were presented, and field trips to the Leonard fire fill plant and the Berkeley pit of the Anaconda Company were arranged. A banquet was sponsored by the Montana section of the American Institute of Metallurgical Engineers, Montana Society of Engineers, and Montana School of Mines.

General Portland and Ideal To Raise Prices of Cement

Two companies plan to increase cement prices up to 15 cents a barrel in Texas and Louisiana in the second quarter of this year.

General Portland Cement Company, Inc., Chicago, Ill., will raise prices at two plants in Dallas, Tex., and at one in Forth Worth, Tex., by 10 cents a barrel to $3.15. At Houston, Tex., the price will rise 15 cents to $3.30.

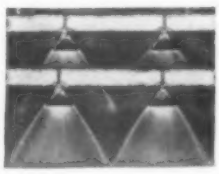
Ideal Cement Company, Denver, Colo., will boost cement prices by 15 cents a barrel at Houston, and at Baton Rouge, La., and New Orleans, La.

Officials of the Alpha Portland Cement Company, Easton, Pa., are considering plans for increasing storage facilities in a proposed expansion program at Birmingham, Ala. The company has just completed a $200,000 expansion concerned principally with perfecting operation of the kilns at the Birmingham plant.

United States Gypsum Company, Chicago, Ill., reported 1957 net earnings at $38,756,752, down 4.6 percent from the 1956 earnings of $40,613,651. The 1957 earnings were equal to $4.78 a share of common stock, compared with $5.01 in 1956.

CONCENCO® Spray Nozzles

for Washing, Sluicing or Spraying



These handy spray nozzles may be used for sheet flow or in staggered arrangement according to need. They are inexpensive, and easy to install. No threading or tapping necessary. All you do is drill one oversize hole for each nozzle, clamp on, adjust and get results. Machined orifices assure accurate, even spray. Send for full information.

THE DEISTER CONCENTRATOR CO. 911 Glasgow Ave., Fort Wayne, Ind.

Enter 46 on card, page 239

Signing of '58 Highway Bill Lauded by Gen. Prentiss As Boost to New System

The Federal-Aid Highway Act of 1958 became law on April 16, when President Eisenhower affixed his signature to the legislation.

Maj. Gen. Louis W. Prentiss (U.S.A., Ret.), executive vice-president of the American Road Builders' Association, described the President's action as "deeply gratifying."

"From evidence now at hand, based on official estimates," he stated, "the total national program, including expenditures for streets, roads and highways financed by local governments and toll authorities as well as the Federal-aid systems, may shape up in the following manner this year and next year (in billions):

	1958	1959
Total construction expenditures	6.6	7.5
Right-of-way and preliminary engineering	1.1	1.2
Construction	5.5	6.3
Project engineering	.2	.3
Net construction	5.3	6.0
Force account construction	.4	.4
Net contract construction	4.9	5.6

"With specific reference to the Federal-aid program, as a result of the provisions of the new law, it is estimated that $200,000,000 of the added $220,000,000 of federal and state funds for the fiscal 1959 Interstate Program will be obligated by January 1, 1959.

"Of the fiscal 1960 Interstate funds (total $2,500,000,000), the 1958 Act, by suspending the Byrd pay-as-you-go provision for 1960 and by increasing the authorization from $2,200,000,000 to $2,500,000,000, makes possible an increase of $1,000,000,000 over the amount which would have been available for apportionment under the 1956 Act, as limited by the Byrd Amendment ($1,500,000,000). It is anticipated that $400,000,000 of the $1,000,000,000 additional for fiscal 1960 of interstate money will be obligated in calendar year 1958.

"It is . . . expected that a total of $1,150,000,000 more will be

(*Continued on page 71*)

Quick connection for better blasting...

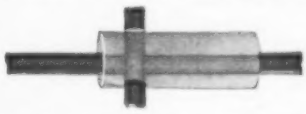
AUSTIN DETONATING FUSE and CONNECTORS

Effective blasting depends upon use of a powerful detonating fuse with proper connection between trunk and lead lines.

That explains why successful strip mines and quarries rely on Austin Detonating Fuse and plastic Connectors. This combination provides a quick hook-up of high strength fuse that won't slip, slide or lose contact in any weather or under any job condition. It also eliminates tying of knots and the resultant possibility of their becoming untied.

Blasting goes according to schedule with Austin Detonating Fuse, for it possesses more than enough power to initiate the entire charge in every hole. Protected with a waterproof covering, it is tough, but flexible . . . won't chip, peel or crack while being laid. It's insensitive to shock, abrasion and stray electrical currents.

AA-4482



First, thread fuse from shot hole through length of connector. Then, press the trunk line into the grooved slots.

Next, return the branch line through the end of the connector on the other side of the trunk line. Pull both ends of branch line tight for positive connection.

USED IN 1833 AUSTIN EVER SINCE

AUSTIN POWDER COMPANY
CLEVELAND 13, OHIO

explosives ◆ permissible dynamites ◆ mine tools ◆ detonating fuse ◆ AP drill heads ◆ Akremite ◆ primers

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DAYTON COG-BELTS* Withstand 3-Year Punishment from Abrasive Dust and Grit

"Our Dayton Cog-Belts have been running 10 hours a day, 5½ days a week for over three years." — D. L. Howard, Plant Superintendent, Valley Quarries, Chambersburg, Pa.

"This set of eight Dayton Cog-Belts on our gyratory breaker is still in good condition even though every belt has taken constant punishment from abrasive grit and dust.

"Experience with other V-Belts taught us how destructive rock dust can be. It was one headache after another . . . with abrasive particles cutting the reinforcing cords or building up in the sheave grooves until the belts were forced off the sheave. All these troubles disappeared after we switched to Dayton Cog-Belts.

"We've found that clinkers or iron grit that would chew up a fabric-covered belt become imbedded in the Cog-Belt's raw-edge sides and have no harmful effect whatever.

"On all our other V-Belt drives, too — crushers, pulsators, conveyors — downtime has been extremely rare.

"Although V-Belts are only a small part of our investment here, they're very important to steady, efficient plant operation. That's why every one of the 134 V-Belts we use are now Daytons. And to top it all off, our Dayton supplier, the Industrial Motor Supply Company in Harrisburg, gives us one-hour service."

For more information and help in solving your power transmission problems, see BELTING in the Yellow Pages for the name and phone number of your nearest Dayton Distributor. *Or write The Dayton Rubber Company, Industrial Replacement Division, Dayton 1, Ohio.*

"You can see how rock dust collects around the average drive. Yet, this 3-year-old set of Dayton Cog-Belts is still almost as good as new." D. L. Howard is looking on while Ralph Peters, of Industrial Motor Supply, examines a Cog-Belt held by John Morgan, the Dayton Representative.

"Examine a Dayton Cog-Belt and you'll see why abrasives don't bother it. The space between each Cog picks up dust before it settles in the sheave and carries it out before trouble develops. The dust problem solved, there's nothing to cause distortion of the belt or force it out of the groove. We've noted, too, that the Cog-Belts seem to kick out stones that cause belts to flip over in the groove."

*T.M.

© D.R. 1957

Dayton Rubber *World's Largest Manufacturer of V-Belts*

DAYTON RUBBER COMPANY, INDUSTRIAL REPLACEMENT DIVISION, DAYTON 1, OHIO

New Dipper Tooth Design Affords Production Gains

A recently patented dipper tooth design, from which units have been fabricated and placed in operation, is showing impressive results in the increased amount of stone loaded by quarry shovels. Appropriately, the designer of the new dipper tooth—Robert Frye—is a veteran shovel operator, who is now shovel superintendent of Marble Cliff Quarries Co., Columbus, Ohio.

Mr. Frye first became interested in the possibility of improving the design of these units in 1908, when he was a craneman on a leading eastern railroad. He designed and forged a set of teeth with wide straight fronts.

During the ensuing years Mr. Frye experimented with several other types of teeth. About ten years ago, in his own workshop, he began developing the present patented, successful design. From many studies on the digging effect with

Robert Frye, shovel superintendent, Marble Cliff Quarries Co., and two dipper teeth of his new design. The unit at the left is from a dipper that loaded nearly 384,000 tons of hard limestone.

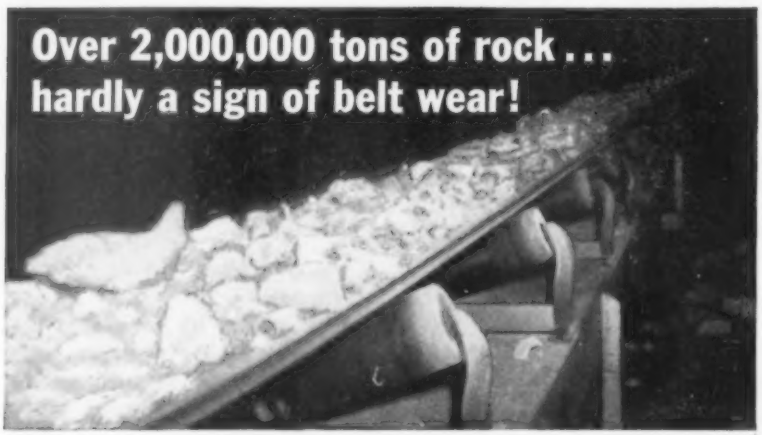
Installed as shown, the new dipper teeth have provided a full dipper load in each pass, with the minimum of spillage.

wood and lead models, the new tooth was perfected; and it is now used for standard production in Marble Cliff operations.

Mr. Frye's design is described as incorporating three advantages: (1) by partly filling in the space between standard teeth, the capacity of any given dipper is increased; (2) spillage of small stones through the slots between standard teeth is practically eliminated, which saves clean-up time and extends the life of haulage unit tires; and (3) digging is improved through the roller action of side flanges on the teeth.

Due to this roller action, small

(*Continued on page 95*)



That's the story behind the New York Rubber Stonore Nyrex conveyor belt, in regular, daily use by a large stone company. In this crushed stone plant, this heavy-duty belt carries stone from the primary crusher, located under the floor of the pit, over a belt distance of 455 feet at a 19° angle.

A belt *has* to be good to stand the tension required here *and* hold up under the abrasive effects of the crushed stone at the same time! Yet, this is the kind of service that is expected—and achieved regularly—with conveyor belting manufactured by New York Rubber Corp.

Take Stonore, for example. Highest in quality, mildew-proof, and built for the most severe service, it successfully handles heavy ores, trap rock, crushed stone, coarse broken glass, slag, cement clinkers, and direct feed from digging and mining machinery. It is also available as a special mucker belt.

If you want the service that this belt provides — or need any other type conveyor belt — it will pay you to consult New York Rubber. Drop us a line — there's no obligation. Address: Department PQ-4.

NY RUBBER

NEW YORK RUBBER
CORPORATION
Established 1851
100 PARK AVENUE • NEW YORK 17, NEW YORK

Enter 50 on card, page 239

WHY ARMAND LABBE CAME TO ALBANY...

Recently, Armand L. Labbe joined the staff of the Industrial Fabric Division of Albany Felt Company as industrial consultant on problems concerning smoke and dust control and other phases of dry filtration. The reason: *to help you find solutions to difficulties in these important areas!*

Considered one of the nation's foremost authorities on smoke and dust control in mining and quarrying, smelting, metal-working, chemical and allied industries, Mr. Labbe recently retired from his position of metallurgist with the American Smelting and Refining Company, after 45 years of service with that firm. In his new capacity, his wealth of experience and background will be available to help you solve dust, smoke and other filtration problems, as time permits.

Albany Felt Company is one of the world's largest manufacturers of special industrial fabrics for wet and dry filtration, finishing and specialized conveying. Please write today for further information on the many custom fabrics and products which are available to meet your requirements more efficiently and economically!

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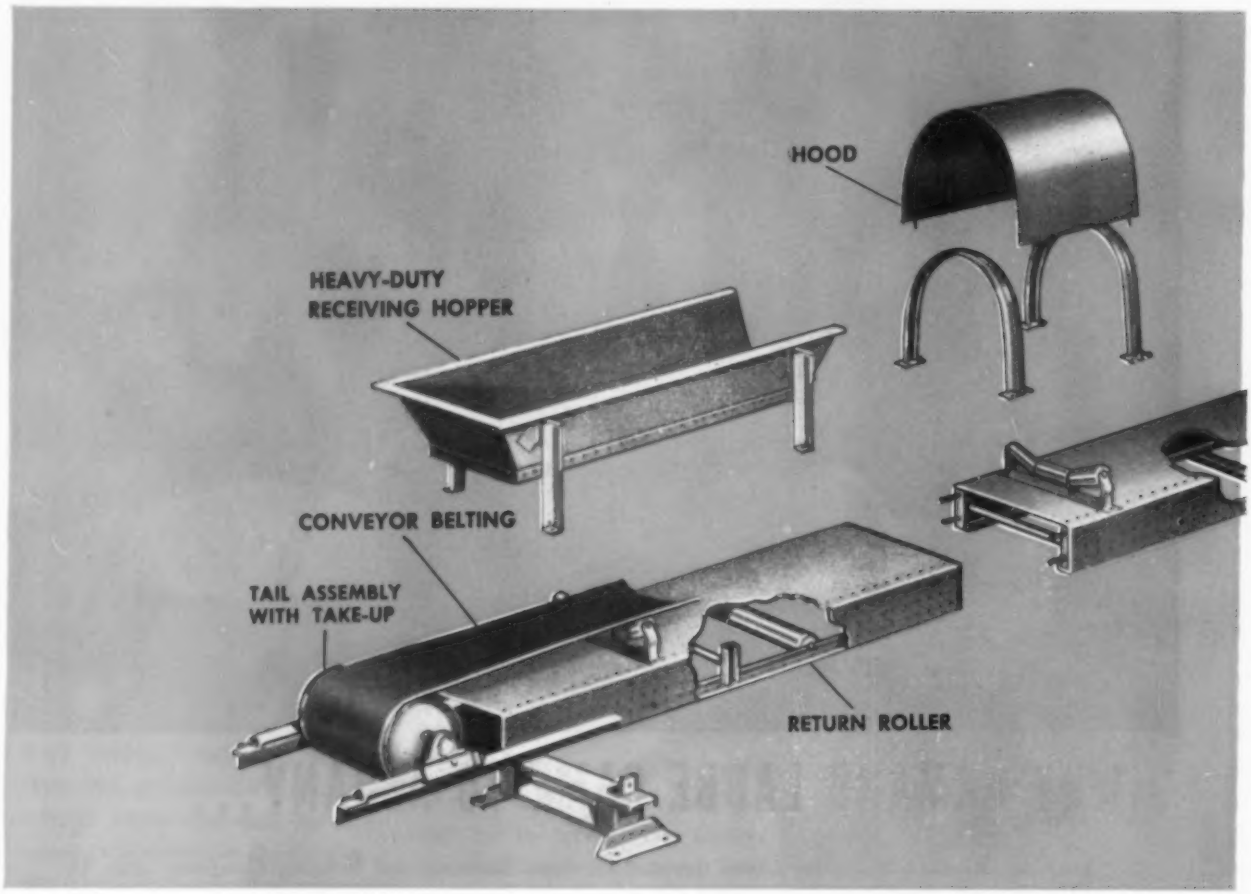
FABRIC
DIVISION

THE WORLD'S FOREMOST PRODUCER OF CUSTOM FABRICS FOR INDUSTRY

ITS QUALITY CONVEYOR COMPONENTS

NOW! STEPHENS-ADAMSON COMBINES INTO A Pre-Engineered



ALL NEW . . . NO OTHER COMPETITIVELY PRICED PACKAGED CONVEYOR LIKE IT!

Here in one competitively priced, complete packaged unit is the efficient, economical and dependable answer to your conveying needs. The combination of STEPHENS-ADAMSON exclusive bent-plate decking, new pulleys with revolutionary crown, and quality conveyor components assure easy erection, maximum flexibility and minimum maintenance cost. Four high-strength bolts fasten head assembly . . . four bolts join intermediate sections . . . six bolts connect tail assembly offering simplified conveyor erection and alteration. More for your purchasing dollar today . . . more for your conveying dollar tomorrow!

Bent-Plate Decking—Punched every eight inches in rows on top, bottom and along its sides; the sturdy, 12 foot sections of steel decking provide many advantages over conventional truss-type construction. In addition to simplified erection and ease of alteration of conveyor, the decking provides protection for return belt run. Return rollers are mounted on underside, shielded from falling material.

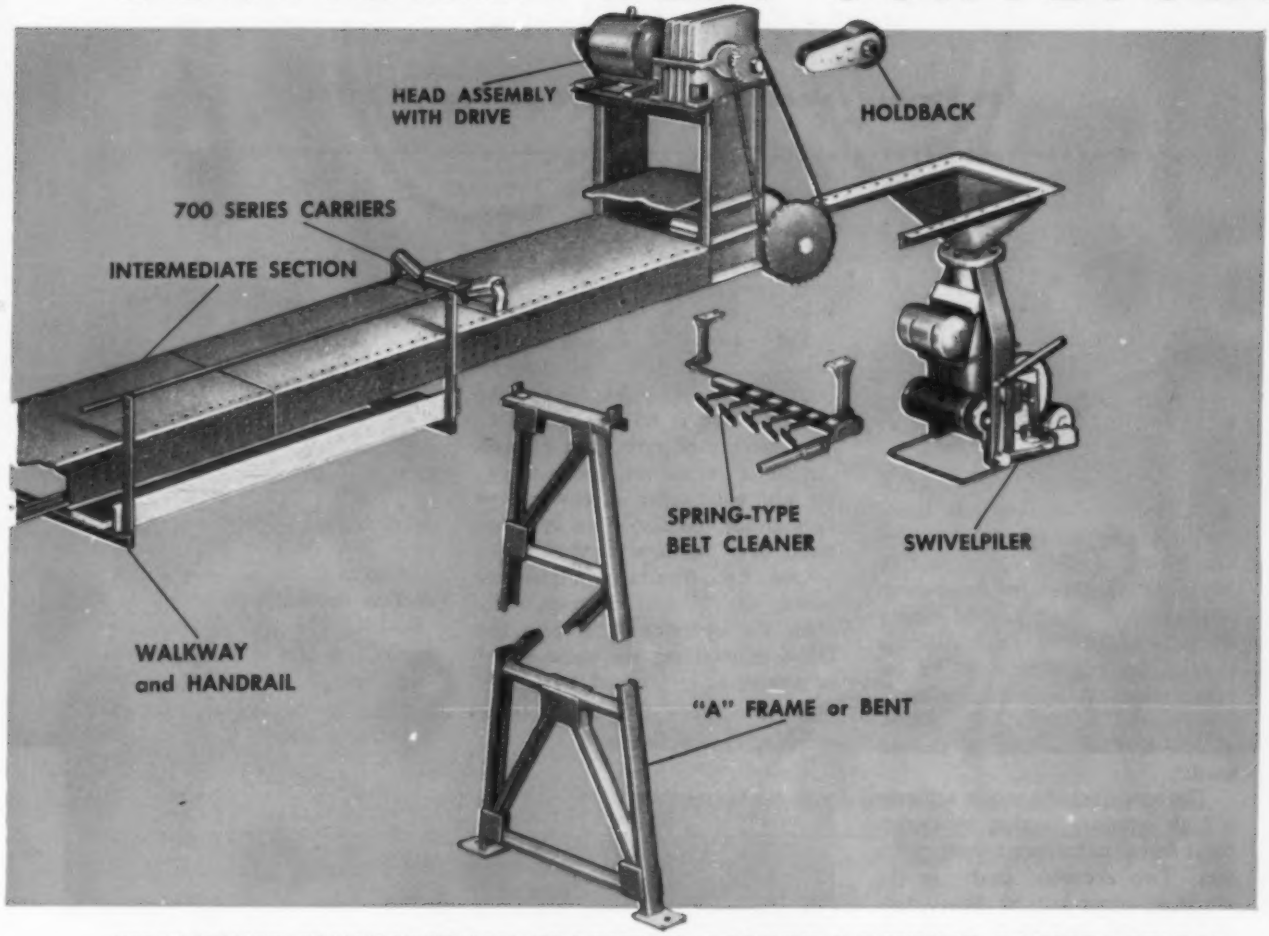
STANDARD PRODUCTS DIVISION

STEPHENS-

GENERAL OFFICE & MAIN PLANT: 20 RIDGEWAY AVE. • AURORA, ILLINOIS

PLANTS AT: CLARKSDALE, MISSISSIPPI • LOS ANGELES, CALIFORNIA • BELLEVILLE, ONTARIO

ITS QUALITY CONVEYOR COMPONENTS
SECTIONAL BELT CONVEYOR!



EXCLUSIVE ENGINEERING FEATURES ASSURE POSITIVE SATISFACTION

- **STEPHENS - ADAMSON Pulleys** — Revolutionary new crown providing more belt training effect with less belt stress . . . featuring new all-steel S-A "Squeezelock" Hub.
- **STEPHENS-ADAMSON 700 Series Carriers** — Precision ball bearing carrier rollers (4" or 5") assure smooth, trouble-free performance. Roller bearing carriers optional.
- **SEALMASTER Self-Aligning Ball Bearing Units** — Performance proven in countless conveyor installations.
- **SACO Speed Reducer** — Rugged, compact, quiet unit... famous for dependability.
- **STEPHENS-ADAMSON Spring-Type Belt Cleaner**—Wipes belt clean of wet or dry materials. Simple to install, adjustable, saves belt, eliminates clean-up maintenance.
- **STEPHENS-ADAMSON Holdback** — Easily mounted on headshaft to prevent belt reversal. Protects equipment and personnel.
- **STEPHENS-ADAMSON Swivelpiler** — Extends reach of conveyors tenfold through centrifugal thrower principle.
- AVAILABLE IN 18", 20", 24", 30" and 36" width conveyors . . . Delivered from stock!

57 YEARS OF CONVEYING "KNOW-HOW" UNDER OUR BELT

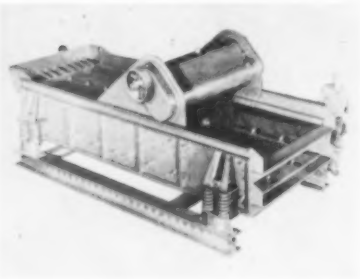
-ADAMSON MFG. CO.

For full information and details WRITE FOR BULLETIN 458.

Coarse grades of ag-lime

New Machinery
and Equipment

For Further Information Use Card on Pages 239-240



● Link-Belt Company has introduced a new heavy-duty Straightline horizontal vibrating screen, CL-Model 58. Designed for dewatering, washing, and sizing a wide variety of materials where head room is limited, the new screen can be cable-suspended or floor-mounted. Where conditions warrant, a combination of both mountings can be used.

The new vibrating screen achieves a high intensity motion by centrifugal force, unbalanced shaft vibrators. Two eccentric shafts in the vibrator, supported by heavy-duty oversize self-aligning bearings, are rotated by a helical gear speed reducer, giving the screen its straightline motion which is so effective in a wide variety of screening applications.

Straightline CL-Model 58 screens are made with single or double decks in 15 sizes ranging from 4 by 8 ft. to 6 by 16 ft. All Straightline screens are also equipped with a snubbing device that limits motion during acceleration and deceleration and automatically eliminates critical vibration in the resonance speed range.

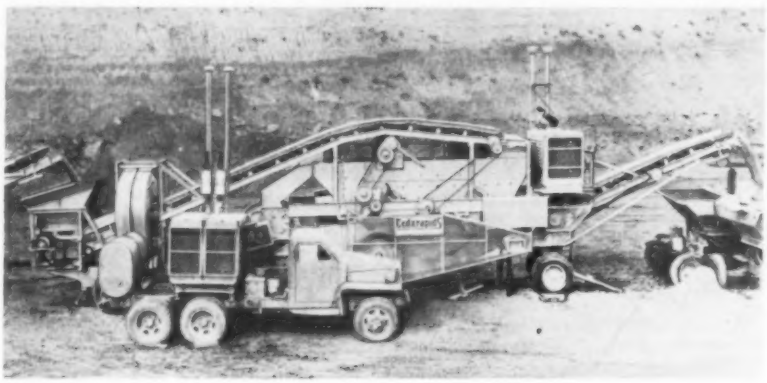
The screen can be equipped with wash troughs, electrically heated decks, bouncing ball decks—or in combination. Screen decks can be equipped to take wire cloth, perforated plates, or wedge wire type of screening surfaces. **(351)**

● A new line of OC-4 crawler tractors featuring added power and transmission improvements have been announced by the Industrial Division of The Oliver Corporation.

The new OC-4 is available in either gasoline or diesel models. Both engines have been designed so that there is 85 percent interchangeability of parts. The gas and the diesel engine are interchangeable with each other. A new heavy-duty clutch has also been incorporated into the new models.

One of the transmission improvements, the "Travel-Reverser," enables the operator to reverse the OC-4 maintaining the same speed in reverse as in forward, by merely de-clutching and pulling back a lever.

Also available is a new speed reduction development known as the "Slo-Lo." The operator can reduce any of the four forward and backward speeds by approximately 50 percent by de-clutching and pulling back a lever. **(352)**



● Iowa Manufacturing Company introduces the Hammeroll, a new portable crushing and screening plant which uses a tandem arrangement of a roll crusher and a hammermill for high capacity secondary reduction.

In operation, the new Hammeroll crushing plant is similar to other Cedarapids portable tandem plants. With the closed circuit design, material fed to the 36 in. reciprocating feeder is conveyed to the 48 in. by 14 ft. triple deck horizontal vibrating screen which takes off specification-size material.

Large oversize is directed to the hammermill, smaller oversize goes to the roll crusher, and the crushed material is then recirculated to the screen for final sizing. Screen decks can be arranged to produce up to four finished sizes, including rock, chips, sand, and fines. **(353)**

Enter 55 on card, page 239 ➔

Coarse grades of ag-lime take longer to reach the plant's feeder root zone and are less desirable.

Ag-lime **FINES** bring more money

Fine grades of ag-lime bring almost twice the market price and are in great demand

(Eagle's portable cage mill at work on property of John W. Karch Stone Company, Celina, Ohio.) The purchase and installation of this plant resulted from a Karch sample being processed into an improved product through an Eagle Cage Mill. Completely satisfied with the results, this machine is now producing approximately 25 tons per hour—easily meeting all state specifications.

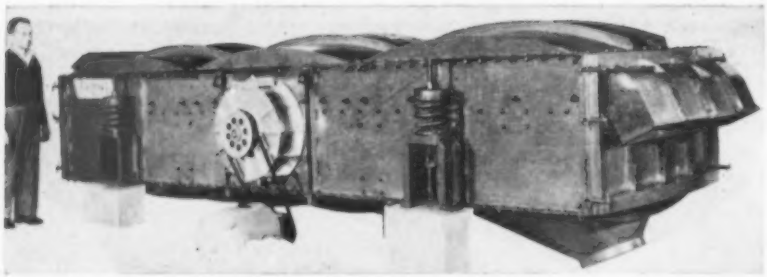
You can pick up the steady big premiums on finer ag-lime. Today's scientific farming demands this grade of ag-lime, which, because it is absorbed faster, can recover the investment faster with cash crops.

EAGLE CAGE MILLS produce more fines!

A single pass Eagle four-row cage mill with its high-speed impact, disintegrating action using hard-faced bars, not only produces a finer aggregate—it increases the tonnage as well! The single pass design has been producing this superior quality ag-lime at an average rate of 30 tons per hour, subject to variations in raw material and weather conditions.

EAGLE
JAW CRUSHERS · IMPACT BREAKERS
PULVERIZERS · CONVEYORS · LOADERS
CRUSHER CO., *Inc.* GALION OHIO·U·S·A

Special offer ... Send us a sample (200# to 500#) of your pit-run ag-stone, *freight collect*, for Eagle's gradation improvement test. We will put it through an Eagle Cage Mill, make a product report, and ship the resulting ag-lime back to you for your inspection. You're welcome to be on hand when the batch is processed, if you can make it. No obligations of any kind. We are convinced an Eagle mill can make more money for you and want to prove it to your satisfaction!

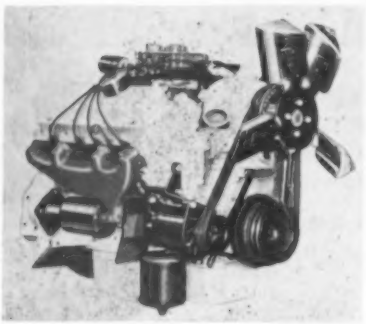


● This Gyroset screen, manufactured by the Productive Equipment Corporation, is an enclosed unit for fine dusty screening such as finished cements, fine ground stone, lime, etc.

The positive eccentric action of Gyroset screens gives a full circle throw over the entire screen surface. With only two bearings, the eccentric action has a minimum of moving parts.

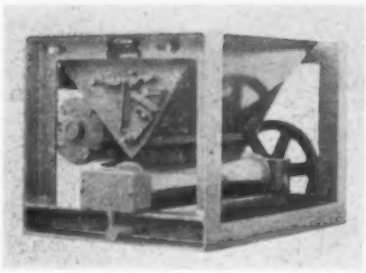
Gyroset screens are equally effective for sizing, slurry scalping, washing, or dewatering, and can operate at any degree of slope. Stroke is adjustable from 0 to ⅜ in.

Sizes available are 36 in. to 72 in. wide, 4 ft. to 16 ft. long, one to three decks. **(354)**



● Ford Motor Company has recently introduced four new industrial engines including the 8-cylinder 534 cu. in. model shown. With the "534", two other gasoline engines, and a new 6-cylinder diesel, Ford now offers a full line of ten basic industrial engines with displacement ranging from 134 to 534 cu. in.

The "534" has a compression ratio of 7.5 to 1, and features high-turbulence wedge-shape combustion chambers, a new fuel induction system, and a new full-pressure lubrication system. Brake horsepower of the complete engine assembly is 252 at 2,800 r.p.m., with a torque rating of 492 ft. lbs. from 1,700 to 2,200 r.p.m. **(355)**



● Carpco Manufacturing, Inc., recently developed a rotating field magnetic separator to remove magnetic contaminants from granulated materials in the dry state. Design permits clean extraction of the magnetic materials with no moving parts exposed to the materials being separated. The magnetic field is created by permanent magnets revolving within a stainless steel cylinder.

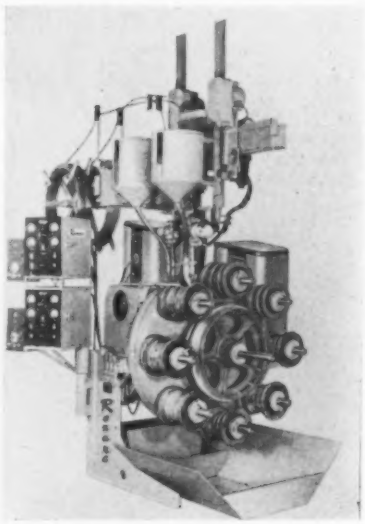
These rotating field separators are offered in 6 in., 18 in., and 36 in. models. **(356)**

● The Frank G. Hough Company announces production of a new Payloader model, the H-25, a rubber-tired front-end loader with a rated carrying capacity of 2,500 lb. The new Payloader can handle a maximum load of materials weighing as much as 125 lb. per cu. ft. using a bucket with an SAE rated capacity of 20 cu. ft.

For handling dense, compacted materials, the H-25 has a breakout force of 4,500 lb. and provides a bucket tip-back of 40 deg. at ground level. Maximum dumping clearance is 5 ft. 4½ in.

A new power-shift transmission and torque converter are matched to provide the maximum in speed of movement and ease of operation. The power-shift transmission is full-reversing and has two speeds. Another feature of the power-train is the power-transfer differential which automatically transfers more torque to the drive wheel with the best footing when slippage is encountered.

With power steering as a standard feature, the Model H-25 is offered with a choice of gasoline, diesel or LP gas power. **(357)**



● The Sight Feed Generator Company has developed a new twin head automatic roller and idler welder and positioner, capable of mounting eight tractor rollers and one idler at a time. Called the Rexarc MS-8, this welding machine builds up both sides of the worn tractor rollers simultaneously.

The twin welding heads operate simultaneously or independently. Welding heads are power-operated both vertically and horizontally by convenient controls, as well as the indexing of turret, and tilting of the positioner. Welding head carriage is equipped with motor drive.

The machine can hard-face or weld on an idler up to 38 in. in diameter without removing any of the spindles. Round weldments up to 46 in. in diameter may be handled by removing all spindles. **(358)**

BIG PROJECTS PROVE IT!

Firestones move more yards per hour on every shift!

From the Texas Turnpike to the Niagara Thruway, Firestone Rock Grip Tires with S/F (safety-fortified) Nylon are reducing breakdown losses, cutting tire costs. Tough Firestone cord bodies withstand severest punishment to last longer with less downtime than any other tire! Two great non-directional tread designs adapt these off-the-highway tires to *any* job condition and eliminate excessive spare tire inventories. You get the *flotation and traction* you need in loose earth and wet going. With the same tire you get S/F Nylon's *armored* protection for hauls over splintered shale and blasted rock. Firestone tires resist cuts and slugging impacts like no other tires made. Ask your Firestone Tire Expert about these *tubed* or *tubeless* extra heavy-duty tires. Call him today at your Firestone Dealer or Store.

ROCK GRIP WIDE BASE ROCK GRIP

Firestone

BETTER RUBBER FROM START TO FINISH

Enjoy the Voice of Firestone on ABC television every Monday evening.

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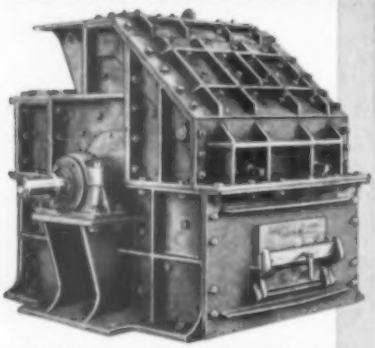
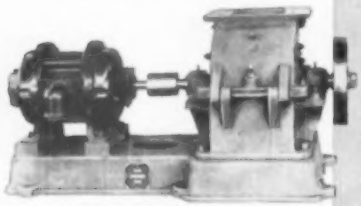
American
HAMMERMILLS
offer
HIGH CAPACITY REDUCTION
at
LOW OPERATING COST



AMERICAN ACS HAMMERMILL
Capacities to 250 tons per hour

AMERICAN "30" HAMMERMILL
Capacities to 100 tons per hour



AMERICAN LABORATORY MILL
Capacities to 2000 lbs. per hour

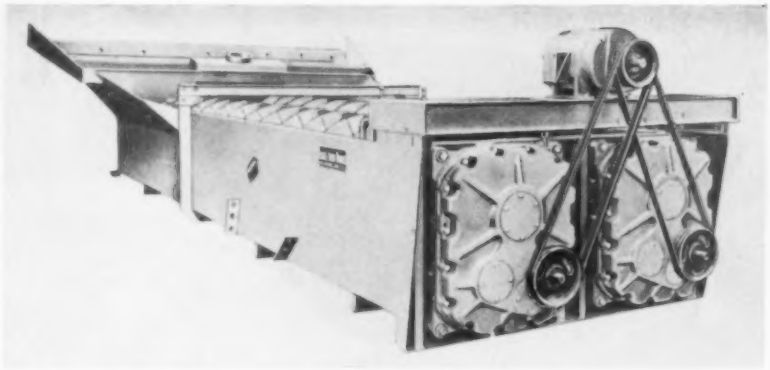
WHAT IS YOUR CRUSHING PROBLEM?

The American Engineering Department will be happy to analyze your reduction problems, make test runs if necessary, and offer specific recommendations. No obligation.

WRITE for complete literature on American Hammermills.

American
PULVERIZER COMPANY
1059 Macklind Ave., St. Louis 10, Mo.

Enter 58 on card, page 239



● Sand and gravel washers manufactured by the Eagle Iron Works are now available with totally-enclosed gears running in an oil bath. The totally-enclosed gears reduce maintenance costs by eliminating the need for frequent lubrication and by keeping out moisture, grit, and dust.

The washer in the above illustration uses steel, helical cut gears. This gear train is driven through a V-belt drive. Speed of the screw flights can be changed to meet various material specifications by quickly changing the sheaves on the drive. (359)

● Tipptronic, Inc., has designed a machine load control with a pre-shut-off warning system to protect equipment through automatic shut-off, automatic warning, and/or continuous on-off automatic operation. The control protects against overload, underload, no-load, and phase failure (single phasing).

The load control is engineered with two separate contact ammeters, each equipped with an indicating pointer, activated by a current transformer connected in one of the motor leads. Responsive to the current, the indicating pointers move identically across the two dials, monitoring and displaying continuously the load on the drive motor.

Each ammeter is equipped with adjustable limit pointers which actuate the warning and shut-off mechanisms. (360)

● Perfection Steel Body Company is now manufacturing a new design of frameless dump trailer which adds as much as 4,000 lb. of legal payload to the tractor-trailer unit.

Specially designed body longitudinals serve as the trailer frames, as well as the solid foundation for the body construction. Thus, the weight of the trailer frame is converted to additional payload. Further increase in payload is gained through the use of a Perfection front-mounted telescopic hoist.

With the frameless features of the trailer, the body length can be economically increased, giving a greater spread between trailer and tractor axles, and permitting increased legal payload without violation of state bridge laws.

The hoist, with its individual

base, is mounted on the fifth wheel of the tractor. High-strength stabilizer arms tie the body directly to the hoist base—thus the body is supported and stabilized at three points. In addition, the trailer springs are immobilized as the body is dumped and the front trailer wheels are raised. The body then rests directly and solidly on the rear axle, adding further to the stability of the trailer.

Perfection also furnishes this frameless dump body in all-welded aluminum construction, which gives an additional 3,000 lb. payload. **(361)**

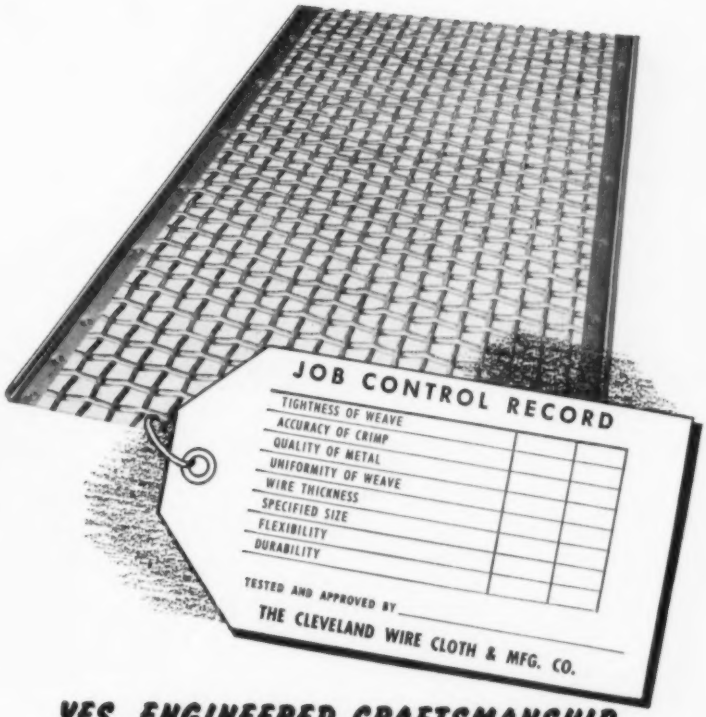
● Ingersoll-Rand has developed a new rock drill known as the "Vacu-jet" dustless stoper, with built-in jet suction and pressure discharge for efficiency of dust control.

In the new stoper, vacuum is developed by an ejector jet incorporated into the backhead of the drill. This vacuum draws the cuttings down through the drill steel and the drill. When the dust and cuttings reach the jet, they are caught in the jet air stream and pushed under pressure through 1-in. air hose to a tank or bag 25 ft. or more away from the drill.

The drill steels have a tapered bit end and shank eliminating the need for forging and heat treating. Reconditioning is done by turning the bit end and grinding or milling the shank end.

Large passages through the specially-designed drill steel allow extra fast, full throttle drilling. A new safety shield protects the operator's hands from falling rock. **(362)**

PRODUCING *Quality* WIRE SCREEN IS A SCIENCE



YES, ENGINEERED CRAFTSMANSHIP IN THE MAKING OF CLEVELAND WIRE SCREEN CLOTH IS IMPORTANT

Yes, making quality wire screens for heavy duty vibrating equipment is more than just a weaving process. To maintain high tonnage output and longer screen life, proper wire thickness, rigid accuracy of openings, and uniformity of weave must be controled.

Cleveland Wire screen sections are designed for all types of mechanical and electrical vibrating equipment.

WRITE FOR COMPLETE BULLETIN FILE

FOR FASTER SERVICE CALL DIAMOND 1-1832

The CLEVELAND WIRE CLOTH & MFG. Co.

3576 E. 78th ST., CLEVELAND 5, OHIO

KOEHRING WORK CAPACITY *in action...*

Swings a big bucket — Notice the size of this dragline, stripping a coal seam in an Eastern mine (below). It's the big Koehring 1205 — and handles 3 to 4-yard bucket, depending on weight of materials. Boom lengths: 60 to 170 feet. This big-capacity stripper also converts to 3-yard shovel. High-lift model has a 3-yard dipper on 40-foot shovel boom — or a 2½-yard dipper on 50-foot shovel boom.

21.5 mph Cruiser® — One man controls all operations, one engine supplies all power for work and travel on Koehring 205 Cruiser crane. There's a full range of low working speeds up to 7 mph — plus travel speeds up to 21.5 mph. It has smooth torque-converter drive, power steering, 27½-foot turn radius, 30% gradability. Usefulness is unlimited in mines, pits, and quarries. 205 Cruiser lifts up to 15 tons — handles ½ to ¾-yard clamshell or dragline buckets on a wide work radius — converts to ½-yard shovel or hoe.

Ship to shore — A pair of Koehring 405 clamshell cranes, mounted on a Great Lakes dredge — one of the world's largest — solved the problem of transferring sand from the ship's hold to shore. With this system, approximately 4,500 tons of sand are unloaded in 6 hours. Crane in foreground dumps into a Johnson Lo-Bin, mounted on flanged wheels. Lo-Bin travels along track, transports sand to a swinging, boom-type conveyor, which stockpiles it at dockside. On clamshell work, Koehring 405 handles 1 to 1½-yd. buckets. Check its other capacities in chart on opposite page.

KOEHRING DIVISION OF KOEHRING COMPANY, Milwaukee 16, Wis.

Here are some figures that will interest you:

KOEHRING MODEL	SIZE DIPPER	LIFT CAPACITIES (Crawler ratings based on 75% of tipping load. Rubber-tired machines — 85% of tipping load.)	
205 CRAWLER	½-Yd.	20,000 lbs.	at 10-ft. radius
205 ON RUBBER	½-Yd.	30,000 lbs.	at 12-ft. radius
305 CRAWLER	¾-Yd.	30,000 lbs.	at 12-ft. radius
305 ON RUBBER	¾-Yd.	50,000 lbs.	at 10-ft. radius
405 CRAWLER	1-Yd.	40,000 lbs.	at 12-ft. radius
445 ON RUBBER	(Crane only)	90,000 lbs.	at 15 ft. radius
605 CRAWLER	1½-Yds.	72,300 lbs.	at 12-ft. radius
805 CRAWLER	2-Yds.	104,200 lbs.	at 12-ft. radius
1205 CRAWLER	3-Yds.	190,000 lbs.	at 12-ft. radius

In heavy rock — Owner of this Southern mine needed a heavy-duty shovel to strip rocky overburden — picked a Koehring ¾-yard 305 for the job. Its powerful digging crowd, and rugged strength of deep-section boom and dual dipper sticks, proved more than a match for the heavy rock. Yet, in work like this, 90% power-assist on main drum clutches gives operator a light lever-pull and sensitive "feel" of load. Power, strength, stability as a shovel increase the 305's work capacity with all attachments. For proof, check its lift ratings (at left).

Want more information? See Koehring distributor.

K760

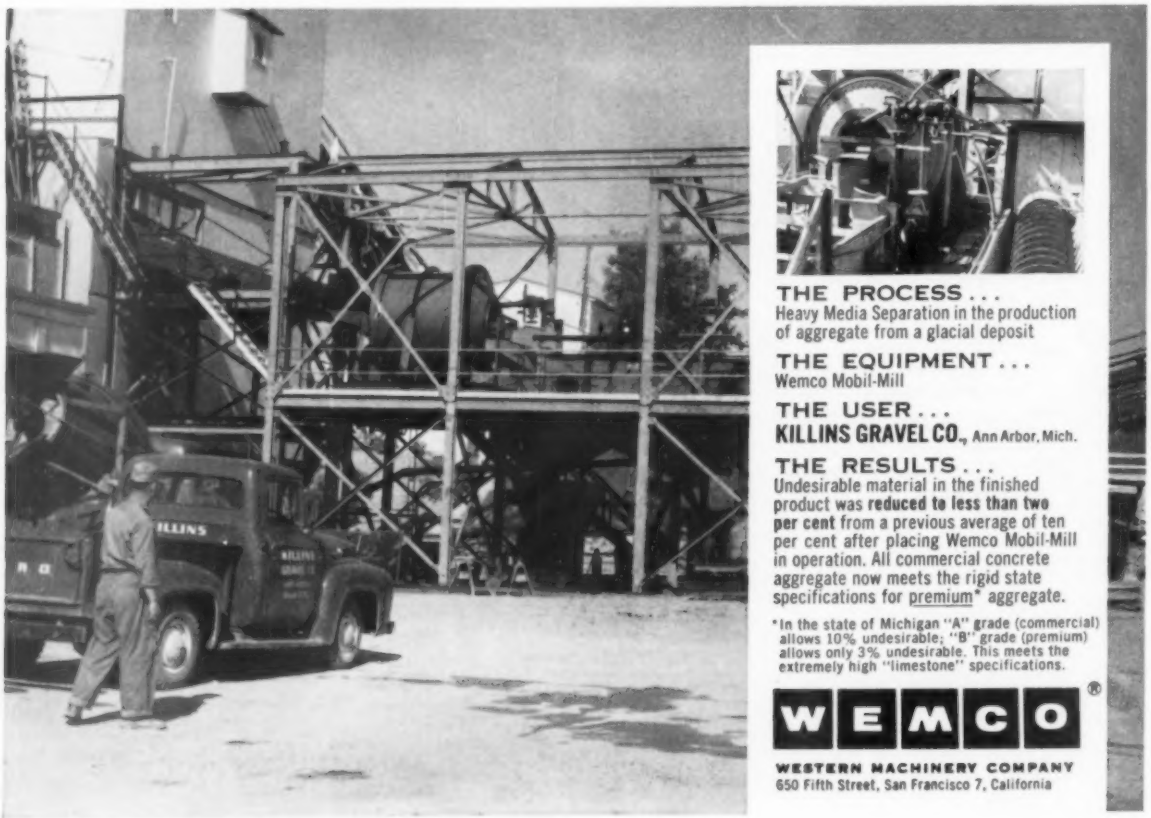
The first Bemis Packer-Ette to be used for packing ammonium nitrate explosives is in operation at the Fidelity Mine of the United Electric Coal Co., Du Quoin, Ill.

● Bemis Bro. Bag Company's Packer-Ette bag packing machine is being used by the United Electric Coal Company to pack ammonium nitrate explosives at its Fidelity Mine, Du Quoin, Ill. This is the first use of the Packer-Ette for packing explosives, and the first known use of a commercial bagger for packing explosives at the mine level. Previous methods of mixing and packing ammonium nitrate explosives have been largely manual in nature.

The explosive is packed in polyethylene bags, Bemis waterproof laminated-textile explosive bags, and in tin cans. A specially designed metal ring or collar makes it possible for United to pack the tin cans as well as both types of bags on the Packer-Ette.

The Packer-Ette will fill a bag or can with the explosive in only 8 seconds. In addition, the Packer-Ette accurately weighs the explosive packed. Filling is controlled by a two-stage pulsating feeder tray. In the initial stage of filling, the tray feeds rapidly. In the last stage, however, it feeds at a slower rate which can be more closely controlled.

Capacities of the Packer-Ette range from 25 lb. to 150 lb. A simple scale adjustment determines the weight packed. United, for example, packs 25-lb. and 33-lb. bags and 30-lb. cans. **(363)**


THE PROCESS . . .
Heavy Media Separation in the production of aggregate from a glacial deposit
THE EQUIPMENT . . .
Wemco Mobil-Mill
THE USER . . .
KILLINS GRAVEL CO., Ann Arbor, Mich.
THE RESULTS . . .
Undesirable material in the finished product was reduced to less than two per cent from a previous average of ten per cent after placing Wemco Mobil-Mill in operation. All commercial concrete aggregate now meets the rigid state specifications for premium* aggregate.
*In the state of Michigan "A" grade (commercial) allows 10% undesirable; "B" grade (premium) allows only 3% undesirable. This meets the extremely high "limestone" specifications.
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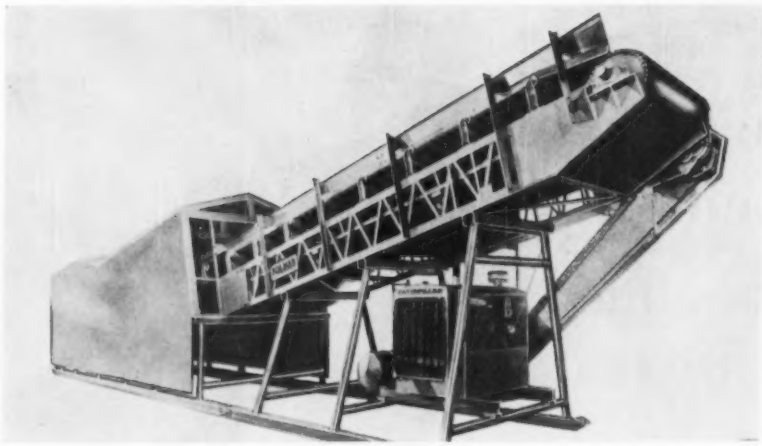
WESTERN MACHINERY COMPANY
650 Fifth Street, San Francisco 7, California



● The Model 303 loader, featuring a 5 ft. wide belt, is the newest addition to the line of heavy-duty conveyors manufactured by the Kolman Manufacturing Company.

The heavy-duty construction of the Kolman 303 is on a massive scale throughout. The conveyor is 50 ft. long, and requires a diesel power unit of approximately 100 hp. or equivalent.

The conveyor is equipped with a feeder-trap combination with tunnel enclosure of the complete tail section extending 29 ft. ahead of the tail plates. It is driven through six C-section V-belts to a heavy-duty gear reducer.

One man controls the unit from the operator's platform located at the head pulley level, where he can readily oversee the complete operation. From this point he operates both feed and discharge by means of extended controls to the feeder gate, engine throttle, and clutch.

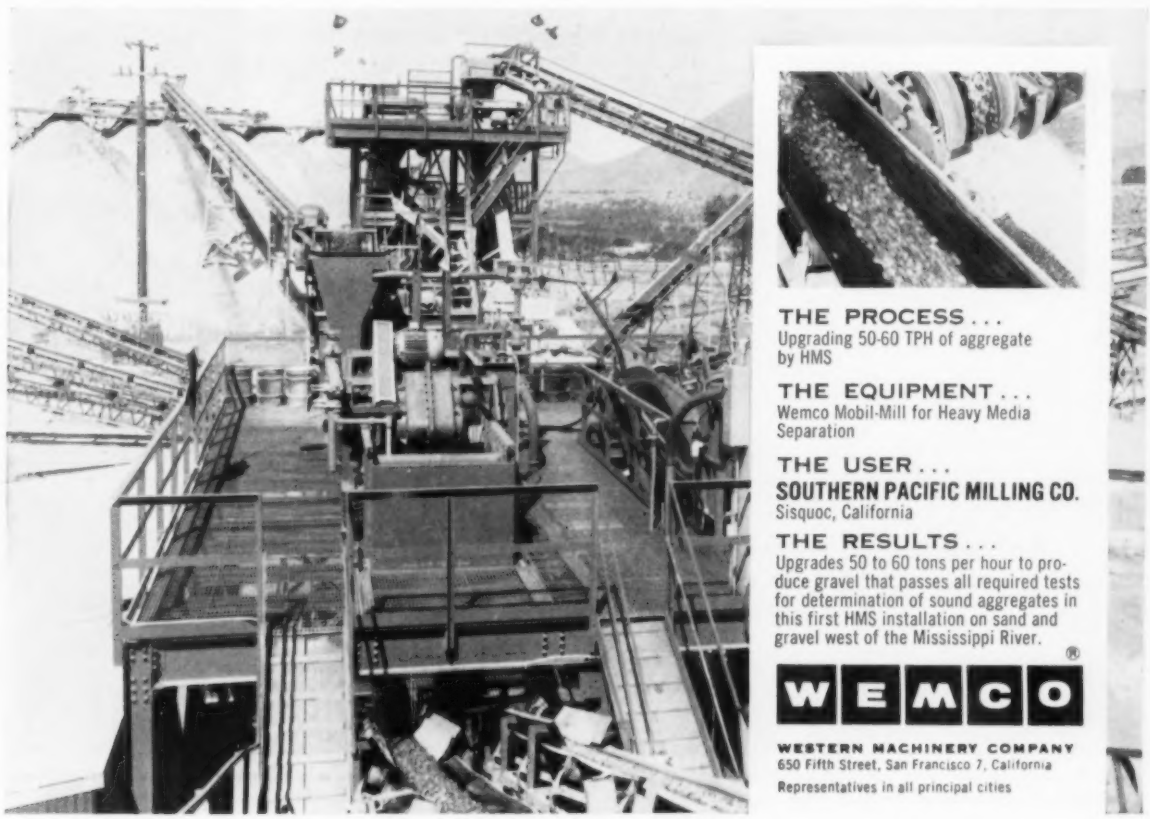
(364)

● Periclase-chrome brick and Unitab kiln liners, available from Kaiser Aluminum and Sales, Inc., are some of the types of basic refractories widely used to line hot zones of rotary cement kilns. The Unitab liners have special steel shims and cardboard spacers bonded to the brick for accuracy, ease, and speed of installation.

Kaiser Chemicals Division is offering a newly-published 32-page booklet which describes and illustrates the step-by-step procedures for the installation of Kaiser Unitab liners and the conventional bare liners. The three stages of installation are covered in great detail and instructions are given for the correct method of "stepping" or "creeping," laying the liners over warped areas, and bricking kilns which have tapered or conical hot zones sections.

Also included is information on material requirements, maintenance, ordering, shipping, and handling. Tables are provided for quick and accurate computation of the number of brick needed to line rotary kilns of most standard diameters.

(365)



THE PROCESS . . .
Upgrading 50-60 TPH of aggregate by HMS

THE EQUIPMENT . . .
Wemco Mobil-Mill for Heavy Media Separation

THE USER . . .
SOUTHERN PACIFIC MILLING CO.
Sisquoc, California

THE RESULTS . . .
Upgrades 50 to 60 tons per hour to produce gravel that passes all required tests for determination of sound aggregates in this first HMS installation on sand and gravel west of the Mississippi River.

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Ever see tougher operating conditions?

Tiger Brand Amerclad is made for this treatment

ON THE TRACK-TAMPING MACHINE shown here, the cable is flexed 4,500 times per minute. Eight powerful vibratory motors are used to drive eight tamping assemblies. Each motor is powered with Tiger Brand Amerclad cable.

It wasn't always that way. Other cable did a good job—for a while. But the shattering vibration actually caused the jackets to peel away from the conductors. Then Amerclad, with its dynamically balanced conductors and tough, lead-cured jackets, solved the problem. In fact, the manufacturer says, "Tiger Brand is superior to anything we have ever seen for this type of service. It is completely dependable under all conditions."

For an interesting contrast, look at the power shovel pictures, and the three-inch diameter Amerclad. It's the same kind of cable used on the track tamper, only bigger and with more conductors. Operating conditions are different, though. Some of the cable is right in the blast area where it is dragged over sharp rocks and pounded by dynamite-propelled boulders. The cable operates 24 hours a day at temperatures that range from 100° in the shade to minus 40° in shoulder-deep snow.

When you specify Tiger Brand Amerclad, this is the quality you get. We make no second- or third-grade line. *All* Amerclad is made to the same exacting specifications—designed for users who demand the very best because they can't afford expensive down time. Why not call your American Steel & Wire salesman and ask for more information about this quality cable?

USS, American, Tiger Brand and Amerclad are trademarks

Notice the long span of the cable bridge and the extreme flexibility of the Amerclad in the foreground. It's the same cable.

Railroad track tamper is a completely self-contained unit. Notice the eight cables which feed separate vibratory motors.

This is a typical power shovel at the mine. The Amerclad runs along the ties and under the tracks.

Tiger Brand Electrical Wire & Cable

a standard Tiger Brand cable for every special job!

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Interlocked Armor Cable • Special Purpose Wire & Cable • Aerial, Underground and Submarine Cable

American Steel & Wire
Division of **United States Steel**

Columbia-Geneva Steel Division, San Francisco, Pacific Coast Distributors • Tennessee Coal & Iron Division, Fairfield, Ala., Southern Distributors • United States Steel Export Company, Distributors Abroad

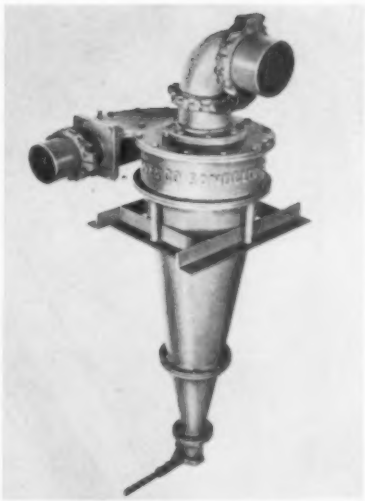
● Designed by the Andrus Machine Works and distributed by Answers, Inc., the Safety Circle mounts an any make or model of crane or shovel to minimize serious accidents and fatalities.

Outside perimeter of the Safety Circle inscribes a circle which practically eliminates the possibility of a worker being in the danger zone. In addition, the Safety Circle minimizes danger from "pinch-points," provides an easy-access job view platform, and broadens the actual field of vision on a job.

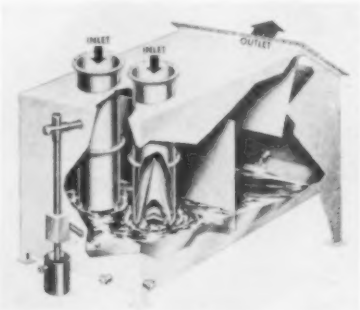
When equipment must be moved any distance, the Safety Circle hinges upward and locks securely in position. The steel mesh platform has an easy-access hinged door for entering or leaving the cab. When a new location is established, the Safety Circle platforms are quickly lowered. (366)

● The Sandclone, a new product of the Western Machinery Company, uses the wet cyclone to separate sand efficiently into desired size fractions. The device, a hydrocyclone type classifier, utilizes centrifugal force set up within a cone to speed up this separation.

Designed specifically for use in the fine aggregates industry, the Wemco Sandclone is particularly useful in the gradation of finer size fractions and in the separation of



fine sands from slimes and clays. It can supplement the Wemco sand preparation machine in this work. Fractions from 4 to 200 mesh are normally handled. A wide range of gradation requirements may be met with minimum adjustments. (367)



● The Turbulaire-Doyle wet scrubber for dust collection is now being offered by the Western Precipitation Corporation under a license agreement from the original developer, The Consolidated Mining and Smelting Company of Canada Ltd. (Cominco.) Its wide range of applications includes gases from screening and crushing operations, dryers, roasters, and ventilation of various transfer points (elevators, bins, etc.).

The Turbulaire-Doyle scrubber impinges dust-laden gas at high velocity into a pool of scrubbing liquid. The high velocity impingement causes the gas and dust particles to penetrate deeply into the liquid bath, accentuating the wetting action and producing unusually high dust collection efficiencies, even on particles in the fume range. (368)

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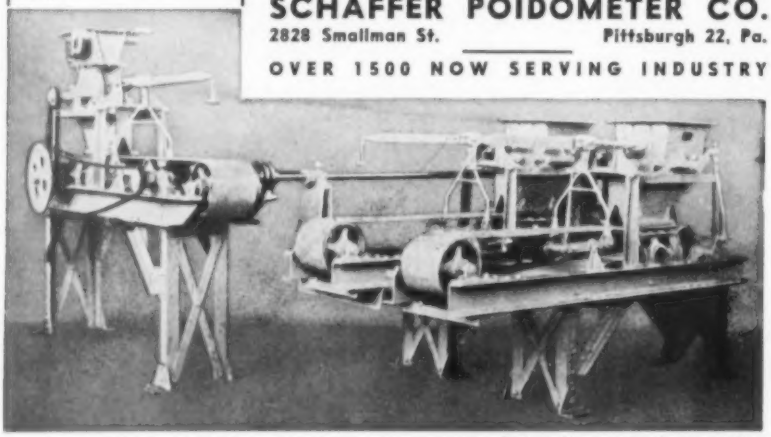

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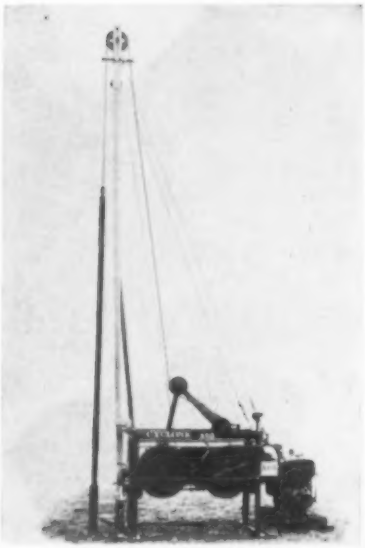


● A small, compact drill, the Cyclone Drillette, has been developed for quarrying operations by the Sanderson Cyclone Drill Company. A one-man rig, the Drillette is easy to maneuver and quick to erect and dismantle. It can be mounted for truck or trailer and can operate from power-take-off equipment.

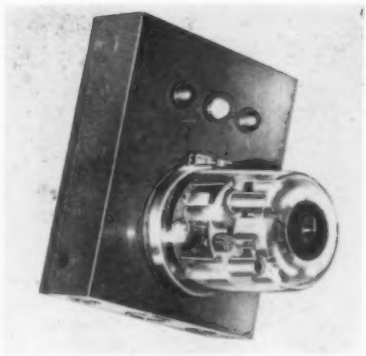
The Drillette is equipped with a 20 ft. tubular derrick with two guide lines and a hand crank for raising the derrick. A rubber shock top in the derrick expedites drilling. **(369)**

● Harris Calorific Company announces the development of its No. 43 welding torch. It is a universal pressure torch, and will operate on high, medium, or low pressures. A wide range of types and sizes of tips are available.

Features of the No. 43 torch include the use of corrugated type thread through the packing area, which prevents troublesome end play and assures positive, sensitive,

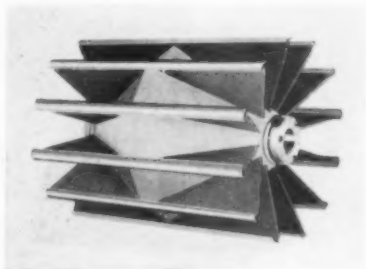
and accurate adjustments of flame. Extra-large gas and oxygen passages permit the use of maximum capacity welding and heating tips.

Since the torch handle is completely solderless—all joints are sealed with "O" rings—replacement of any part can be accomplished quickly and easily on the spot. **(370)**



● The Load Star Corporation has available a new feed control which maintains within 5 percent a constant and unwavering flow of feed into pulverizers, hammermills, extractors, mixers, attrition mills, roller mills, and other motor-driven processing machinery.

Effective liquid feed control can also be achieved. The manufacturer claims the installation of the Load Star control may improve the production capacity by more than 30 percent and prevent jammings and breakdowns due to overload. **(372)**



● A new line of Barry "QD" wing-type pulleys for minimizing belting wear and replacement costs has been developed by the R. & J. Dick Company.

The new pulleys have a demountable "QD" type tapered hub assembly for easy installation and a firm grip on the shaft.

The service life of belting is increased by the new wing-type pulleys in many installations, according to company officials. The wing design provides for the flowing away of spilled materials which might otherwise get between the pulley and the belting. The design also reduces the area of contact between the belting and the pulley. Typical installations are as elevator boot pulleys and conveyor tail pulleys. **(373)**

● This large aluminum dump body, manufactured by the Heil Company, has a capacity of 37½ cu. yd. The truck is 30 ft. 3 in. long, 12 ft. 4 in. wide, 11 ft. 11 in. high, and weighs 54,000 lb.

This vehicle, one of several models of huge off-the-highway type trucks made by Mack Trucks, Inc., is powered by a 335 hp. turbocharged diesel engine, and can carry a load of 67,000 lb. **(371)**

Pioneered and perfected by Hughes—Tri-Cone rock bits set the standard of performance the world over. Back of each Hughes bit is the industry's greatest rock bit experience . . . plus a half century of laboratory and field research. Wherever you drill, Hughes bits—either regular or jet—are available in the sizes and types best suited to your particular drilling requirements. And of this you can be sure—the Hughes bits you get will incorporate the very latest in rock bit improvements!

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Washington News

(*From page 12*)

allied products, food and beverages, and paper and related products industries anticipate increases of approximately 3 percent in the coming year. Of special interest may be the fact that the stone, clay, and glass products industry is the only durable goods industry which is looking forward to an increase in the next year, amounting to 1 percent higher in 1958 than in 1957.

A small decline in consumer expenditures and a 2 percent decline in sales for 1958 does not appear to be sufficient to account for all of the concern about a deep and prolonged economic recession. Where, then, is the difficulty? It is in answer to this question that the change in businessmen's expectations for expenditures on plant and equipment becomes most significant. Businessmen's responses show that they expect to spend approximately $32,000,000,000 on plant and equipment during the year 1958. This is a 13 percent reduction from last year's record of $37,000,000,000. Of special importance is the fact that the decreases from 1957 are quite widespread across most industries. The only outstanding exception is public utilities, which hope to increase their capital outlays.

Capital Outlay Decline A decline of about one-fifth in capital outlays is anticipated by manufacturing and mining firms, and also by transportation companies other than railroads. The commercial group expects to reduce its expenditures by approximately the average percent, that is, 13 percent. The worst decline in outlay is slated to take place in the railroad industry, which reports that its capital expenditures will probably be reduced by as much as 38 percent.

In assessing these figures, it is important to remember that 1957 constituted a new record high for capital expenditures. Acutally, if $32,000,000,000 is spent in 1958, it will be the highest figure for any recent year except 1956 and 1957. Even allowing for price increases, the volume of capital expenditures in 1958 will be well above that of 1953, 1954, and 1955.

The current plight of the railroad industry is reflected quite completely in its capital expenditure figures. In 1958 that industry plans to spend less for construction and equipment than in any year since 1948, except for the year 1954. Its equipment purchases are being cut to almost one-half of what they were last year, while its construction program is being cut by approximately 15 percent.

Status of Consumer All of the above seems to add up to the conclusion that the recession has not yet affected the consumer segment of the economy. This is a very hopeful sign. If the consumer segment can be maintained in a healthy condition, the recession is unlikely to develop into a major catastrophe. The capital goods factor has, clearly, been seriously affected. The basic problem, therefore, is to prevent that trend from developing in the consumer segment.

Protective Measures The principal measures to be taken currently to accomplish this result are primarily in the areas of encouraging the construction industry. In connection with highways, there are measures under consideration which would provide the states with $1,500,000,000 between now and the end of July, which otherwise would not have been available at all and to move up to July approximately another $1,500,000,000 that would not otherwise have been available until December. How much of this money will actually be spent is problematical because so much has to be done in connection with acquiring rights-of-way and other planning that it will take some time to get the money into circulation.

Similarly, the various aids to housing, such as the reduction in down payment requirements and the money available for buying mortgages, may have a great effect or very little depending on whether builders will build what customers want to buy. At the same time, the increase in the public works program is rather meager. Over all, the construction industry and those allied to it are being given every opportunity to play an important role in the anti-recession fight. If they can actually accomplish what is expected of them, they will contribute substantially, not only to the well being of the nation, but also to their own prosperity.

Signing of Highway Bill

(*From page 47*)

obligated between now and January 1, 1959, than would have been obligated if the Act of 1958 had not become law.

"These contracts will result in collateral benefits to industry not reflected by the 'construction in place' figures in the tabulation for calendar year 1958 and will be caused by the placing of orders by the successful contractors during the remaining months of 1958, largely for 1959 delivery."

Some of the major items include: 290,000 tons of fabricated steel; 200,000 tons of re-enforcing steel; 15,000,000 bbl. of cement; 1,600,000 tons of bituminous material; and equipment costing $175,000,000.

Canadian Nonmetals Output Makes Good Showing in '58

The Dominion Bureau of Statistics, Ottawa, Canada, has reported the 1957 output of the following nonmetallic minerals, with comparable 1956 production volume:

	Volume (Tons)	
	1956	1957
Asbestos	1,014,249	1,048,084
Cement	5,021,683	6,066,381
Gypsum	4,895,811	4,598,294
Lime	1,295,699	1,400,989
Salt	1,590,804	1,771,559

Net income of the Penn-Dixie Cement Corporation, New York, N. Y., last year declined to $5,956,457, or $2.14 a common share from a restated $9,894,541, or $3.73 in 1956. Earnings were readjusted on the basis of a percentage depletion allowance. Net sales were $40,743,792 in 1957 and $48,573,614 in 1956.

Giant Portland Cement Company, Philadelphia, Pa., reported that net income increased from $2,412,170 in 1956 to $3,009,630 in 1957, including $518,900 in depletion allowance.

Labor Developments

LABOR-MANAGEMENT VIOLENCE

By S. HERBERT UNTERBERGER

S. Herbert Unterberger and Company
Economists-Consultants on Labor and Industrial Relations

Washington, D. C.-Philadelphia, Pa.

IT IS frequently supposed that the use of violence in labor - management relations is a thing of the distant past. Recent reports, however, particularly those of the United States Senate Select Committee on Improper Activities in the Labor or Management Field, have tended to show that the use of violence is still engaged in by both sides in labor disputes.

Report on Teamsters Union Thus, in their bill of particulars against the Teamsters Union, the committee has the following to report:

"They have condoned violence as a proper method for settling labor-management and inter-union disputes.

"An organized Teamster goon squad operating out of Tennessee was used to whip employers and union members into line in that state and in the surrounding area. Leaders of the goon squad were W. A. Smith, who has a record of 17 arrests and 12 convictions, and ex-convict Glenn W. Smith, whose extensive record includes two convictions for armed robbery. These and other Teamster's officials were identified before the Committee with arsons, dynamitings, and brutal beatings of employees, non-strikers, and even members of their own union.

"The Committee developed a pattern of extreme and extensive violence in Scranton, Pa., and also in Flint, Mich., where a Teamster auto was used in an attempt to run down and kill an employee of the union which was being struck by a Teamster local."

Operating Engineers Union Similarly, in discussing the Operating Engineers Union, the Committee reported:

"The Committee finds that William E. Maloney, the just-resigned international president of the Operating Engineers Union, achieved domination over Local 150 in Chicago through an alliance of hoodlums and mobsters. Maloney used his associations with these mobsters as a weapon of terror against the members of Local 150 and as a means of advancing himself within the Operating Engineers Union to the presidency in 1941.

"The murder of Dennis Ziegler, a rank-and-file member of the local, for his courage in standing up to Maloney's corrupt leadership, is an unerasable blot on the modern history of the union. Maloney kept Local 150 and Local 399 in trusteeship since their inception in 1929, despite frequent membership attempts to escape this form of labor dictatorship."

Use of Violence The more recent evidence taken by the Committee in connection with the long-drawn-out Kohler strike shows that violence can develop even in areas where trade-unionism has a long history. The testimony clearly brought out that violence was engaged in by both sides in this dispute. The company's action of organizing an arsenal and hiring a large number of outsiders, some of whom had rather unsavory reputations, is matched by the equivalent Union action of intimidating non-strikers and otherwise attempting by force to prevent the operation of the plant.

Not only are there these highly publicized incidents, but also from time to time, what would appear to be day-by-day labor relations are punctuated by some very extreme form of combat. An interesting case occurred recently in connection with the operation of two-boats on the Mississippi River, which involved violence in the most extreme form.

The story starts in August, 1954, when the Masters, Mates and Pilots Union started an organizing drive for the crews of those boats. Shortly thereafter the captain of a boat questioned one of his crew members about organizing activity and warned that if he ever heard that union people were aboard his boat, he would fire them.

Not long after this, eight of the nine crew members on that boat had signed a pledge card to join the union and sent them to the union, with the request that the union send representatives to confer with the crew. When the boat next landed, such representatives did come aboard the boat to meet with the crew.

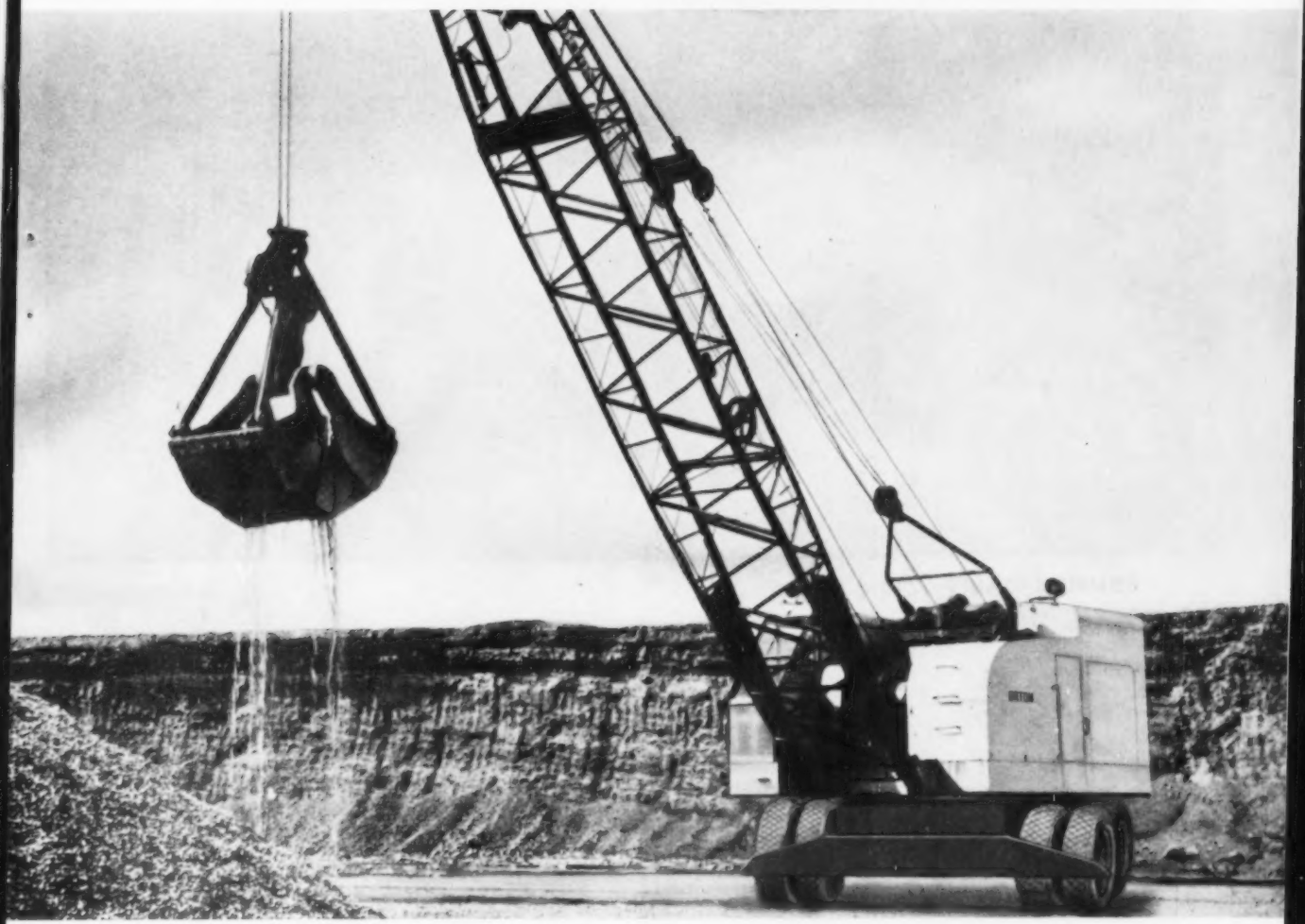
The captain entered that meeting and ordered the union representatives off the boat. Obscene language was used, an altercation followed, and blood was drawn. Finally, the crew left with the union representatives, and a strike was called.

The captain tried to move the boat, an illegal action without a proper crew, and was prevented from doing so by a union representative and then by the local Coast Guard commander. He obtained a crew and moved the boat. In the following passages the United States Court of Appeals describes the situation:

"Captain J. W., in Louisiana recruited three of his brothers, three nephews, a son, and two or three unemployed deck hands and armed them with .45 or .38 caliber revolvers. . . . They unloosed the tug from the barges and spent the next two days moving slowly down the river.

(*Continued on page* 99)

for aggregate handling, use orton experience



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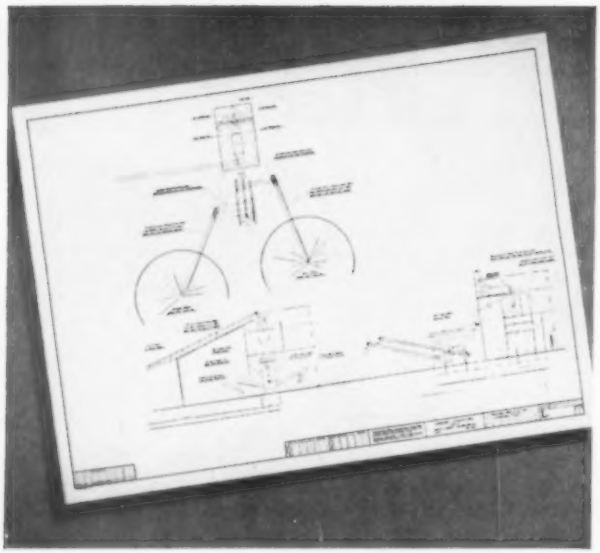

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. . . And the men from Hewitt-Robins are available every step of the way to help make the most economical use of your resources in building an installation geared to produce profits. Here's how:

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PLANT LAYOUT—The most practical use of terrain and access, modern conveying and sizing systems, and the latest developments in automation will be included on your flow-sheet.

EQUIPMENT SELECTION—The combined knowledge of *experts* on all phases of your plant (conveying machinery, screens, crushers, conveyor belts) is used in recommending the right equipment for your particular job.

FROM STANDARD STOCK UNITS

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INSTALLATION—Hewitt-Robins will build the plant complete or furnish any specialized assistance you may require.

MAINTENANCE—We also offer maintenance plans which provide for regularly scheduled inspections by our maintenance experts, on-the-job training of your maintenance personnel, and well thought out spare parts programs. This is especially important because H-R manufactures conveyor belt, idlers, screen cloth, as well as replacement parts for other components... items that are integral parts of any maintenance program.

This kind of integrated planning is possible because of Hewitt-Robins' wide experience and technical know-how in materials handling. Each manufacturing division of Hewitt-Robins specializes and is expert in its own phase of design and manufacture. The Rock Products Engineering Group coordinates this experience and technology to provide you with better integrated plant operation at minimum cost.

You'll find, too, that Hewitt-Robins' nation-wide network of strategically located warehouses brings savings to users of H-R industrial machinery products through faster fulfillment of new orders . . . faster delivery of replacement parts . . . fewer lost production hours when mechanical breakdowns occur.

Hewitt-Robins manufactures a rugged line of equipment for use in the rock products industry, including idlers, conveyor belt, vibrating screens, screen cloth, heavy duty scalpers, feeders, sectional conveyors, reducers, level indicators, and trippers. To find out how Hewitt-Robins products and services can help you, consult your classified telephone directory for the nearest H-R representative, or contact Hewitt-Robins, Stamford, Connecticut.

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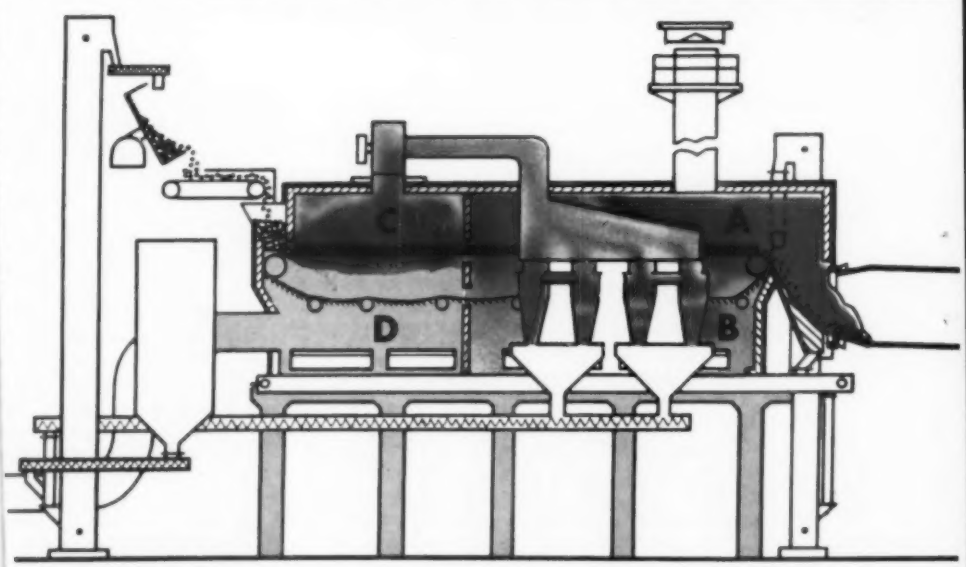
Clean and...
EFFICIENT

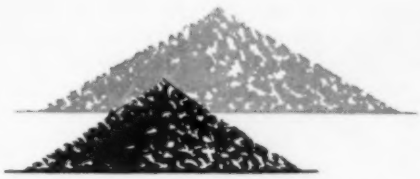
THE
ACL
SYSTEM



ACL is an Allis-Chalmers trademark.

Enter 76 on card, page 239

A new concept in cleanliness! The new *ACL* system offers lower dust loss — cleaner cement production. Stack discharge is merely a wisp. Complete dust-free plants have been constructed within large cities and in suburban neighborhoods. The system meets even the most stringent municipal air pollution codes. Other advantages are: maximum burning efficiency, reclamation of material, power savings and small space requirements.



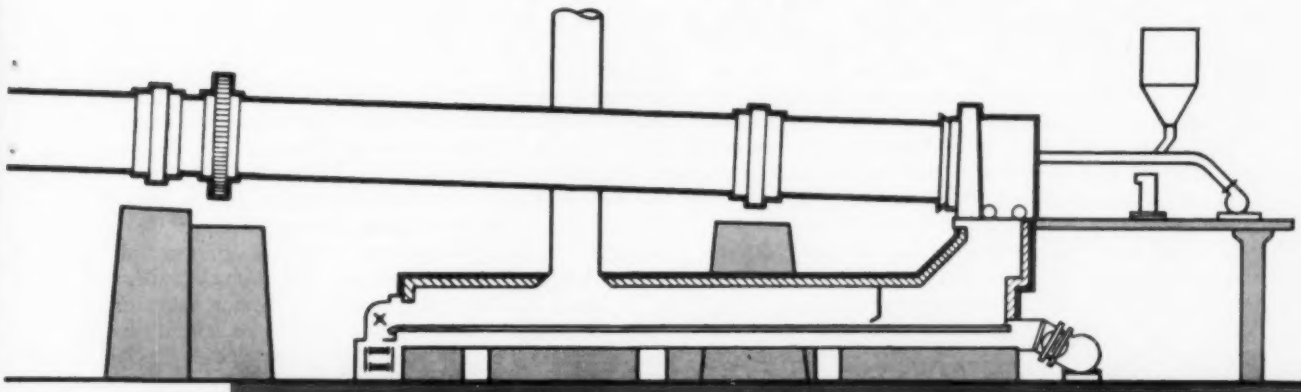
40% less fuel per barrel of clinker

ACL systems now in operation consume fuel at an average of 600,000 Btu per barrel of clinker. Compare this to fuel requirements of conventional long, dry-process kilns which use from 800,000 to 1,000,000 Btu. And the *ACL* double-pass system is designed to use any conventional fuel—powdered coal, fuel oil, natural or coke oven gas.

For details, ask your A-C man for a copy of Bulletin 07B8431. Or write Allis-Chalmers, Industrial Equipment Division, Milwaukee 1, Wisconsin.

How the *ACL* double-pass system works

Partial calcining and dust reclamation take place as hottest gases pass through pellet bed on traveling grate. Gas temperatures are reduced from about 1800 to 500 degrees in this first pass (A to B). Next, gases pass through cyclones where larger dust particles are removed, and carried back to pelletizer. Final dust filtering takes place as gases pass through moist pellets on feed end of grate. In the second pass (C to D) gas temperatures are reduced more. Heat of kiln gases is transferred to material.



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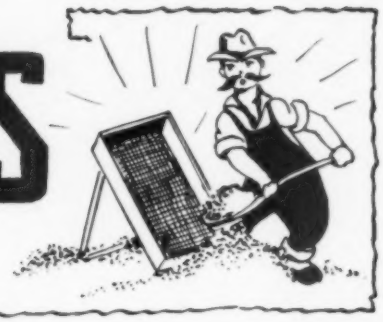
SCREENINGS



By RAY L. SMITH JR.

LAST week I was the guest, with about 24 other business paper publishers, of the U. S. Naval Academy in Annapolis. The occasion was a three-day NAVY-NBP (National Business Publications) seminar to acquaint the publishers with the Academy and to receive a picture of today's Navy and that of the future. The experience would have been of equal value for you, so I thought I'd tell you a little about it.

These men were all from big and small publishing companies—a cross-section of the eastern half of the United States—and toppers in their profession, but they sat through the meetings, seeking any pearls that might fall from the rostrum. The Naval officers, mostly admirals, were also toppers in their profession, and could lead their listeners unconfused through a long explanation of subjects such as these: "What sea power is," "Nuclear wars and limited wars," "The spectrum of international relationships," "Guided missiles," and many others. At the end of each session the subject was open for discussion, and everybody joined in the free-for-all.

There are about 3600 midshipmen now at the academy, which was founded on its present site in 1845 by George Bancroft, then Secretary of the Navy. It now comprises about 200 acres on the Annapolis side of the Severn River. We dined with these boys the first night in their mess hall, and it was astonishing how every last boy was served in about 30 minutes. The dinner of course was "plus" as it would be expected for our nation's finest. The high point of the seminar was getting acquainted with some of the boys who will some day be the experts in our naval arm.

The Atomic Age is upon us, but it is still beset with many troubles. No matter how high we go in the air, there will always be a need for water transportation. We must continue to control the wide gulf which divides the world, across which the United States and Russia face each other. Russia is now embarked on a course which, if successful, will lead to world domination. Her principal effort will be to isolate the United States from its friends and allies. Whatever the cost, our Navy must be prepared at all times. Today it can cover over one million square miles in 24 hours.

In the near future Regulus II and the Polaris missiles will be available for launching from nuclear-powered submarines. We need the freedom of the sea lanes to be able to launch these weapons from any place on the seven seas against any potential enemy. It is the prayer of all of us that not one will ever be launched, but we must have the capability, for the ability of both sides to destroy each other is the only way to eliminate war.

The shipbuilding and conversion program is designed to meet the challenge of the Atomic Age. It is a major increment in the Navy's plan to anticipate the rapidly advancing techniques of warfare and to incorporate nuclear power, nuclear weapons, and guided missiles. The USS *Nautilus*, the first nuclear-powered submarine, has exceeded all hopes in operational capabilities. She has steamed over 26,000 miles without refueling. Half of this has been completely submerged. Four additional nuclear-powered submarines are either being built or in the planning stage.

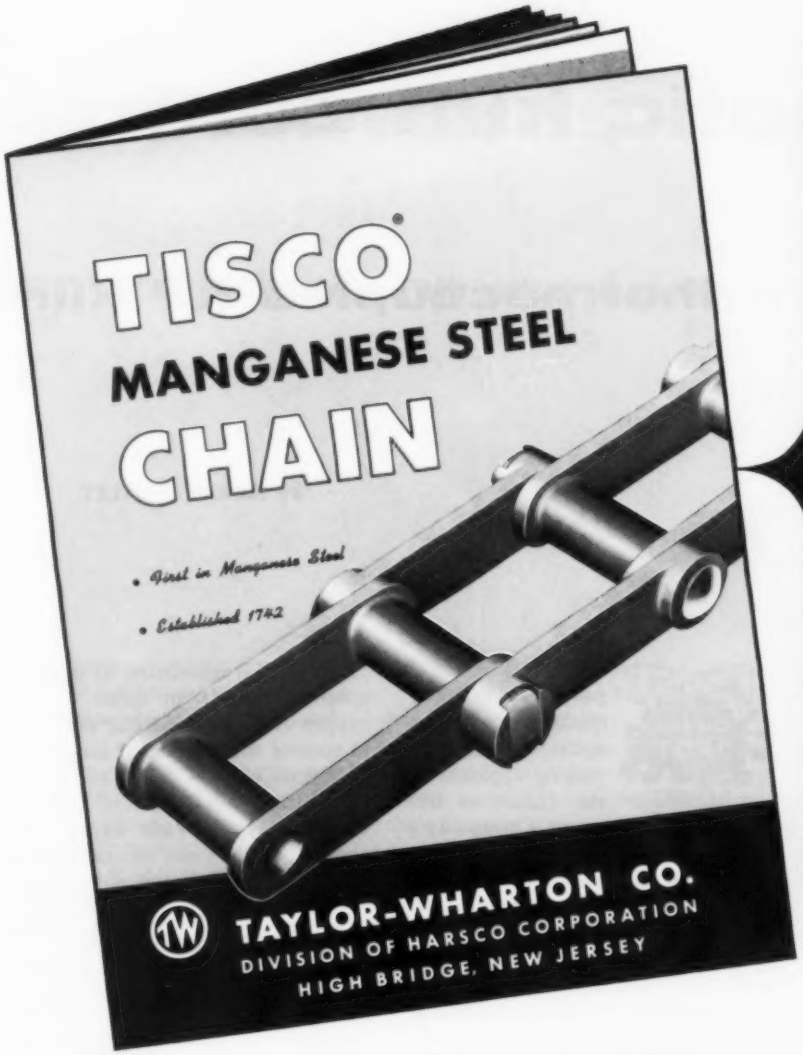
An interesting project includes the development of a long-range missile. The Navy intends to launch these missiles from ships. This will give to the missile the tremendous advantage of mobile bases.

It can be stated unequivocally that the attack aircraft carrier is the most important single type of ship that we have in the Navy today. In the foreseeable future it will play an indispensable role in offense and defense. It provides the only system of mobile bases for planes. We will need at least 15 carriers of this type. The attack weapon systems of the attack carrier are guided missiles, heavy attack aircraft, and the air strike group aircraft. The conventional anti-aircraft battery is replaced by anti-aircraft guided missile launchers.

An air attack system which is receiving increased attention is the Navy's long-range jet seaplane. This plane can use any reasonably sheltered body of water in the world as a landing field.

The effectiveness of any organization depends upon the ability of the men in charge. I had a good chance to see this ability in action, for presentations were made by Richard Jackson, Assistant Secretary of the Navy; Vice-Admiral Robert Pirie, Commander, U. S. Second Fleet; Vice-Admiral Edward Clexton, Chief of Naval Material; Rear-Admiral William Schoech, Deputy Chief, Bureau of Aeronautics; Rear-Admiral Charles Weakely, Director, Anti-Submarine Warfare Readiness Division; Rear-Admiral Albert Mumma, Chief, Bureau of Ships; Rear-Admiral Charles Kirkpatrick, Chief of Information; Rear-Admiral W. R. Smedberg, III, Superintendent, U. S. Naval Academy; Captain Henry Miller, Director, Progress Analysis Group. In addition, we had dinner and a discussion session with Admiral Arleigh A. Burke, Chief of Naval Operations and William B. Franke, Under-Secretary of the Navy.

As you can see, these men comprise a high percentage of the top brass of the Navy. Without a doubt, they are the most practical and the most dedicated group of men I have ever met. You can be assured your Navy is in good hands.



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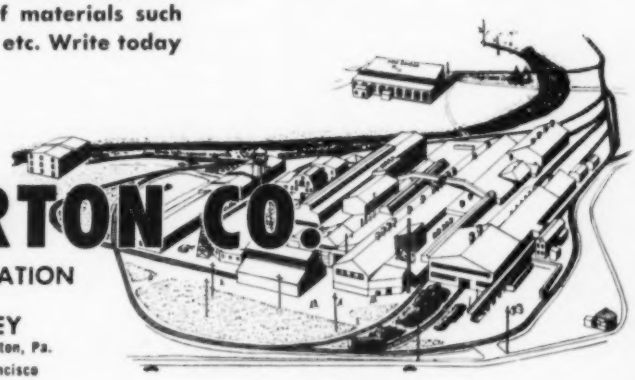

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Automatic kiln control

thermocouples for kiln

By HARRY F. UTLEY

Detail of brush carrier and pickup rings for the thermocouples.

This view shows two wells on "E" kiln and connectors to the pickup rings.

ANOTHER ON THE SPOT REPORT

IMPORTANT gains in clinker quality and in fuel economy are becoming apparent as the Calaveras Cement Company's plant at San Andreas, Calif., nears the end of its first year's experience with automatic kiln-burning control.

The system, presently confined to the company's fifth and newest rotary kiln, designated as "E" kiln, was conceived and developed jointly by Lewis A. Parsons, consulting engineer (recently retired) and M. C. Sutton, chief chemist of Calaveras, with considerable help in instrumentation from Nels Swanson, Swanson Engineering Co., Inglewood, Calif.

Calaveras management has long been recognized for its leadership in advanced techniques in cement manufacture, having taken the initial step toward proper combustion and clinker burning ten years ago, when a Cambridge oxygen and combustion analyzer was installed on the "C" kiln. Additional units were installed shortly thereafter on two other kilns. This instrument continuously analyzes for oxygen and combustibles in the gases leaving the kiln, and the information is indicated and recorded for the benefit of the kiln operator.

The same concept was further advanced on the plant's "D" kiln in 1952 by instrumentizing to provide control of draft-fan speed by the oxygen recorder-controller and thus to control the amount of secondary air drawn into the kiln. This setup maintained, within narrow limits, a constant oxygen (and excess air) content in the gases of combustion and led to further fuel economies.

The basis for the present automation on "E" kiln was established in 1956, when ratio control between fuel setting and fan speed was instituted. Any time the operator changed the fuel setting, the fan speed responded immediately and proportionately, thus maintaining the predetermined fuel-air ratio.

It was found that an almost linear relationship exists between fuel flow and the fan speed required to induce the proper amount of combustion air. This relationship is utilized by feeding the signal from the fuel-flow measuring orifice through a converter (to change the square-root signal to a linear signal), to a ratio relay; the output signal of the latter sets the "set point" of the fan-speed controller.

This linear relationship changes slowly, due to the changing resistance in the kiln and cooler (rings, bed loading); so the oxygen controller changes the basic ratio in the Brown ratio-relay to maintain a constant oxygen content in the exit gases. Fan speed is controlled by

at Calaveras

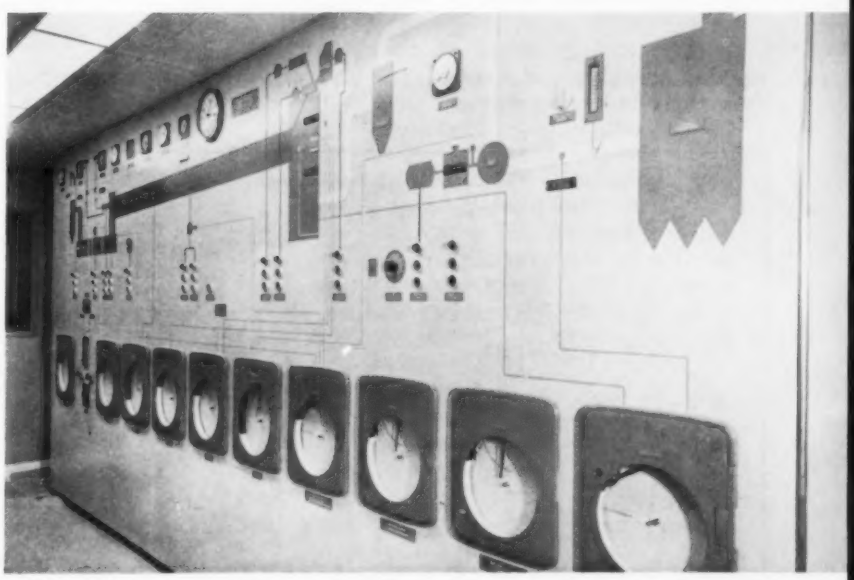
temperature housed in wells

pneumatically setting the speed rheostat in the Regutron control for the Electric Machinery magnetic clutch. (Fig. 4).

However, the kiln operator normally has no way of knowing how the other phase of burning efficiency—heat transfer—is progressing until he is able to see the material from the firing end of the kiln, usually a distance of 50 to 60 ft. Then, only the fact that the reaction occurs with a rapid increase in temperature and incandescence indicates that proper heating of the raw materials has occurred.

If the mix has not been properly heated and calcined, the burner must make drastic fuel adjustments, which are then usually too late. These adjustments are reflected throughout the kiln and frequently result in throwing the kiln off balance for several hours, with consequent reduced fuel economy and possibly sub-standard clinker. In fact, if most of the CO_2 has not been driven off from the limestone portion of the mix prior to reaching the burning zone, no increase in temperature at that point can save the clinker, which will have excessive free lime.

Until recently, the kiln operator has been forced to rely on the exit-gas temperature for his information. It is customary in many cement plants to install a thermocouple in the exit gases just as they leave the kiln. The burner soon finds, for each kiln and its rate of feed, that if the exit temperature falls below a certain point, the mix will not be adequately pre-heated and calcined, and poor clinker will result. Exit temperatures as high as 900 deg. F. are required for some kilns. A temperature as high as this, of course, performs no useful function at the feed end, being much greater than that necessary to evaporate the water. It is valuable to the kiln operator only as an indication that adequate heat transfer is taking place in the center of the kiln. This is a vital "blind spot" where the burner has, heretofore, been able to estimate conditions only indirectly from the temperatures at each end of the kiln.



The panel board on which the automatic-control instruments are centralized. Since it is laid out graphically, it gives an accurate picture of burning conditions at all times. It is housed in a dustproof glass cubicle on the burning floor.

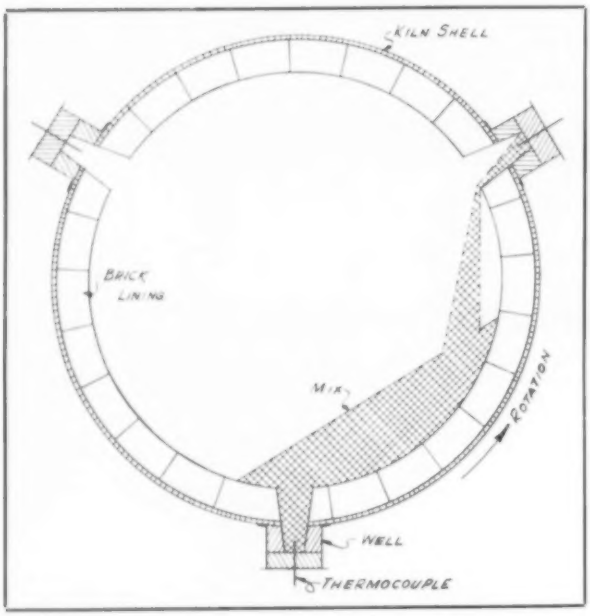


Fig. 1—A cross section of kiln, showing the relation of wells, thermocouples, and mix.

The cement industry has long known that, if it were possible to obtain a reliable temperature of the mix, as contrasted with the temperature of the gases, at some point prior to the critical point (but reasonably close to it), less drastic and more gradual fuel changes could be made. This would enable the kiln operator to assure arrival of the mix in the burning zone at the proper temperature and with adequate calcination. A thermocouple at such a point would first record the temperature of the mix for the guidance of the burner; and later, after proper standards were established, it could be used to control the fuel automatically to maintain the optimum temperature.

Cement plant management ran into many difficulties, however, at this point. Thermocouples projecting through the brick were found to yield a temperature reading fluctuating between that of the gas and that of the mix, and the results were too erratic for reliable control. Such a thermocouple installation was mechanically weak and short-lived. If imbedded in the brick so as to be protected, the lag was great, and results were again erratic, with an added complication of rising temperature as the brick eroded.

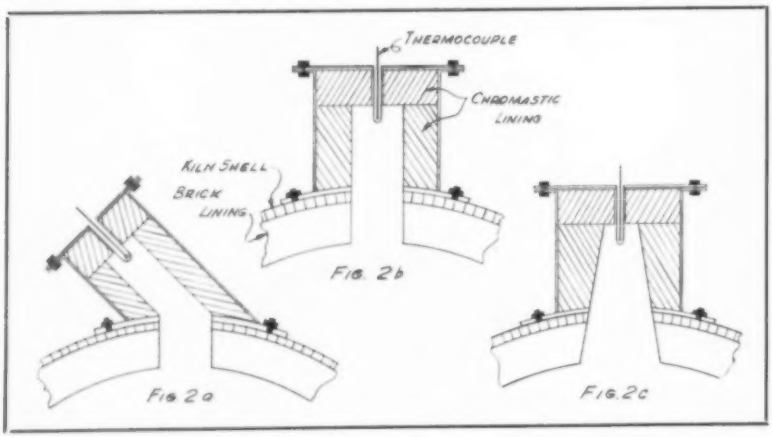
"E" kiln is 360 ft. long and 10 ft. 3 in. in diameter inside the refractory lining. Since this is a wet-process installation about 44 ft. of the kiln length is occupied by the chain system. The kiln rotates at about 1¼ r.p.h. and slopes $\frac{7}{16}$ in. per ft., giving the material a residence time of about 2 hours. Natural gas is used as fuel. The mix has a calculated depth of 11 to 15 in. in the bottom of the kiln and makes contact with 68 to 80 degrees of the circumference (Fig. 1). Obviously, a thermocouple protruding through the brick would be in contact with the material only about 22 percent of the time, and in contact with the combustion gases at a much higher temperature the rest of the time.

The interesting manner in which early experiments of Calaveras were called upon to provide a solution and thus make automatic control possible and successful, was related on March 29, 1958, at San Francisco during the A.I.M.E. Pacific Southwest Mineral-Industry Conference. At the meeting Mr. Sutton presented a technical paper embracing much of the foregoing and all of the succeeding information.

"During an earlier study," Mr. Sutton stated, "material had been drawn from a kiln through ports in the shell into an insulated container with a thermocouple in the bottom. It was decided to attach such a container (well) to the kiln so that it would fill at the lower part of the rotation and empty at the upper part. These wells are formed by casting Chromastic compound inside a section of 10-in. pipe. Various types of wells were tried, some of which are shown in Fig. 2.

"The inclined well (Fig. 2a) was designed to retain the material load in contact with the thermocouple as long as possible. It was later found that this prolonged contact was not necessary, as the thermocouple remained at the same temperature even while the well had no solid material in it during the upper part of the rotation. This is attributed to the fact that there was no flow of hot gases through the well past

Fig. 2—Various types of wells which were tested. The type at the right (Fig. 2c) was the one finally adopted as the most efficient.



the thermocouple and that the heat content of the gases which replaced the solid material was not sufficient to change appreciably the temperature of the well and thermocouple.

"The second type (Fig. 2b) was then installed in a position normal to the kiln shell and was made shallower. This type obtained satisfactory mix temperatures as long as it emptied freely, but it had a tendency to plug.

"The third type (Fig. 2c) was then installed, and it has functioned satisfactorily in all respects for nine months.

"When these experiments began, it was thought that to obtain a continous temperature record it would be necessary to have the recording thermocouple immersed in solid material continuously; so three wells were spaced 120 deg. apart circumferentially around the kiln, with split collecting rings to record temperatures progressively from each thermocouple. This was found to be unnecessary, and now only one well is used. This well is located about 170 ft. from the firing end of the kiln. A Chromel-Alumel thermocouple with a stainless steel protector tube is used. The recorded temperature averages 1,400 deg. F.

"The thermocouple is connected to two phosphor-bronze collecting rings mounted around the kiln on insulating blocks, with springs to compensate for thermal expansion. The original three insulated segments are now electrically connected to provide a continuous record with one thermocouple. The temperatures recorded by the three thermocouples differed slightly, a fact which was atrributed to variations in location of the thermocouples within the protector tubes and/or possible variations in the protector tube ends.

"The thermocouple EMF is picked up from the rings by means of brushes supported in carriers which track the rings. The ring system and brush carriers are shown in the accompanying pictures.

"The EMF goes to a Foxboro Dynalog temperature recorder-controller (pneumatic control with automatic reset) on the control panel. The pneumatic signal from this controller goes through a Moore limiting relay (to limit high and low fuel settings) to a Foxboro indicating flow controller (pneumatic control with proportional and automatic reset) which controls the fuel valve to maintain constant material temperature at the thermocouple. Fuel and primary air flow are recorded and the ratio of primary air to fuel is controlled by a Foxboro ratio receiver recorder controller (Model M40 with proportional and automatic reset). Fig. 3 is a schematic diagram of this system. The secondary air ratio is maintained by changes in fan speed as described previously, and then trimmed by the Foxboro oxygen recorder-controller.

"This system of obtaining the mix temperature at the calcining zone in the kiln is working well. Any shifts in the optimum temperature at the control point, approximately 110 ft. from the beginning of the burning zone, where the exothermic reaction begins, causes an immediate response in the fuel flow, accompanied by a proportional change in the primary and secondary air. This response is much faster than is possible for a human operator to obtain, particularly when he is trying to deduce conditions in the critical center of the kiln from temperatures obtained at the burning and exit ends."

The system has been on automatic control now for more than a year, and substantial gains in burning efficiency and clinker quality are being realized, Mr. Sutton said, although figures are not currently available for publication.

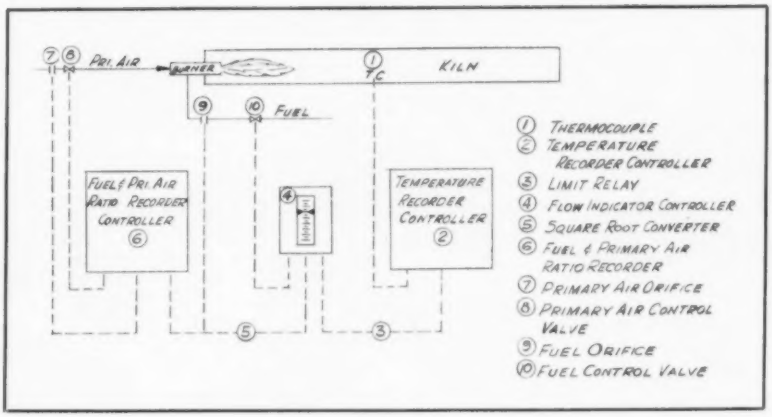
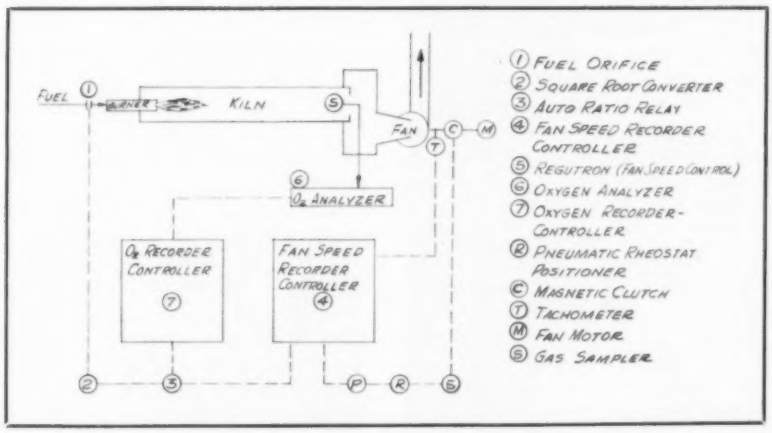


Fig. 3—Schematic diagram of automatic burning-control system.

Fig. 4—Schematic diagram of fan-speed control by fuel flow, trimmed by oxygen content of exit gases.



automatic control

in board-lath plant— use latest techniques

ANOTHER ON THE SPOT REPORT

THE new gypsum products plant of Fibreboard Paper Products Corporation near Florence, Colo., embodies the latest features of advanced engineering design. Bulk handling of raw materials and automatic control in this recent installation of the company's "Pabco" building materials division help to make it an unusually efficient operation. The most advanced techniques were employed to maintain a low noise level, and every possible provision was made for the safety and comfort of employees. Products of the new facility include a wide range in type and size of gypsum wall board, sheathing, and lath. It is the only plant in Colorado manufacturing these products.

Gypsum deposits which supply the raw material for the operation are at Coaldale, 50 miles west of the plant. The property was purchased in 1954 from Ideal Cement Company, which had used it to supply raw material for its Portland, Colo., plaster plant, and retarder for its cement plants. Ideal now purchases gypsum for its plants from Fibreboard.

At Florence the deposit has little overburden and is heavily folded in 40- to 80-ft. veins. Drilling in the open quarry is done with a Gardner-Denver Air-Trac drill using 3-in. steel. Holes are spaced 10 to 12 ft. apart, and the face is from 20 to 30 ft. high. Dupont Nitramite is used in the face, and large rocks are broken down by block-holing. A 1-cu. yd. Northwest Model 6 shovel loads two International RF92 trucks with 16-ton end-dump bodies. These haul the rock about 2 miles to the railroad, where it is reduced to 5-in. minus size by a Pennsylvania Type T, Size A KW single-toothed roll crusher. Conveyors can feed the rock either to a stockpile or direct to railroad cars.

The rock is shipped 50 miles east on the Denver & Rio Grande Railroad, through the Royal Gorge, to the plant. There the gypsum rock is discharged into a track hopper, from which a belt conveyor feeds it to a Pennsylvania Type T, Size ARW hammermill. The minus ½-in. product is carried on a belt con-

Opposite page: The gypsum plant of Fibreboard Paper Products Corporation at Florence, Colo., was designed to include the latest features of advanced engineering. In the foreground is the administration building.

veyor to three 75-ton circular steel bins. Two are fed through a split chute, and the third by a short belt conveyor. No raw storage is needed at the plant as the quarry is operated around the year except for a few exceptionally cold days.

These bins feed three Raymond calcine-grind hammerhills which are gas fired through separate combustion chambers. These are automatically controlled, the drying temperature varying with the moisture content. The product—90 percent through 100-mesh—is carried in the air stream from the mills to a 30-ton stucco bin.

Drag and screw conveyors feed the stucco to an Ehrsam standard pin mixer. Water, paper fiber, flour, and soap are added (first mixed in a Lightnin' mixer), and the mixture also goes to the pin mixer. The board mix is discharged from the pin mixer in three streams to the board machine when board or 16-in. lath is being made; only two streams are used when making 24-in. lath. The rolled paper used comes from three of the company's paperboard mills, one located at Antioch, another at Vernon, Calif., and a third at Port Angeles, Wash.

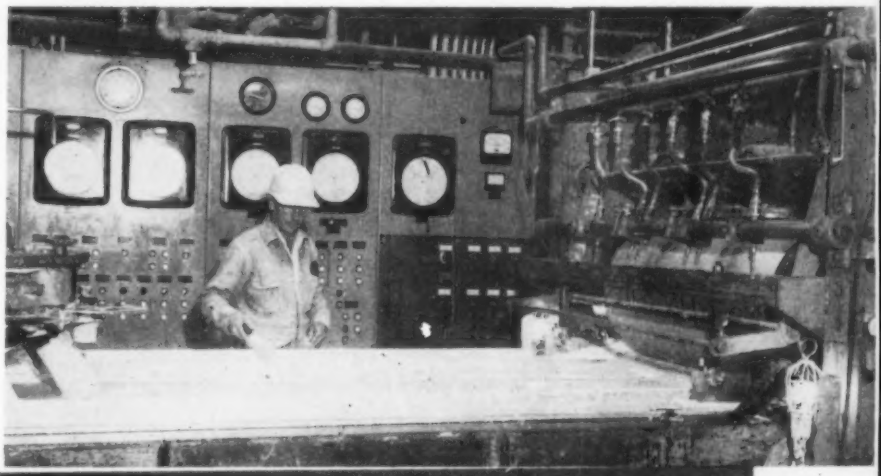
The Ehrsam board machine has a 250-ft. belt section with a Goodyear white wallboard belt 57 in. wide. Following this is a 133-ft. live-roll section, then an Ehrsam cutter and knife. An accelerating section 35 ft. long feeds to a transfer, which has an Ehrsam inverter consisting of two scissorlike sets of arms. This turns the board over so that it goes into the drier with the back down, protecting the face paper from damage by the drier rollers.

The board sections double up, and the feed tipple automatically places them in the 10-deck Coe gas-fired drier. This drier is divided into two drying zones, each of which has its own fans. The first zone has clockwise air flow and the second, counterclockwise.

A standard offbearing tipple feeds the board from the drier to a live-roll section. A board transfer and handling machine of new design feeds to a bundler, which prepares the product for shipment.

All handling of materials and products within the plant is by Yale & Towne lift trucks. The warehouse area is ample, and all car loading is done under roof. Plaster in sacks from the Portland plant is stored for loading mixed cars at the Fibreboard plant.

The plant itself is an excellent advertisement for the company's



This action picture shows Rockwell Canda, mixer man, checking the board mix at the feed end of the board machine. The mix is discharged from the pin mixer in three streams to the board machine when board or 16-in. lath is being produced. For 24-in. lath, two streams are used. Note the main control panel for the board machine.

Gypsum rock from deposits at Coaldale, Colo., is shipped 50 miles east by rail to the new gypsum plant. There the rock is discharged into a track hopper.

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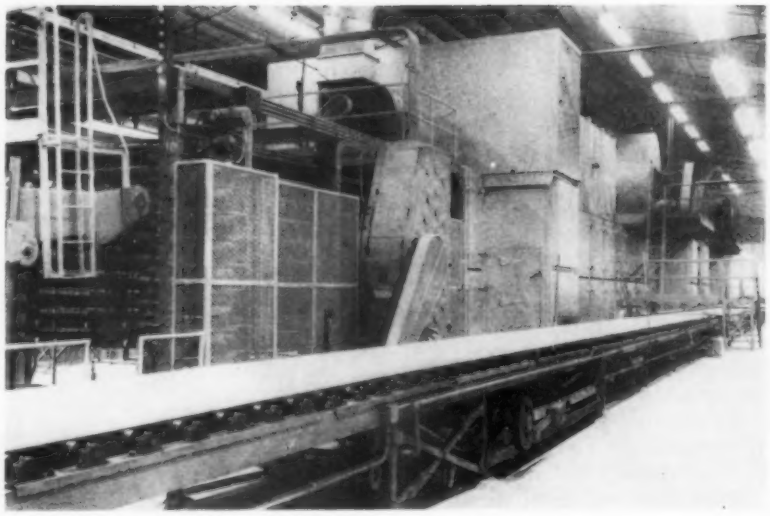


Setting, cutting, and drying operations in gypsum wallboard production are all in view in this scene. In the foreground is the 133-ft. live-roll section, carrying the board to the cutter and knife. At the end of the line the flow of cut board is reversed and the sections are inserted in the 10-deck gas-fired drier.

products. It is of steel-frame construction, and its external walls are covered with a special gypsum wallboard. Other Pabco products, including built-up asphalt and felt roofing, flooring, and paints, were used in the construction. The red and yellow exterior finish identifies the company's products; and with the blue plastic used for the upper one-third of the plant's walls, it presents a striking appearance. A sprinkler system provides protection against fire, the water for this and process use being pumped from the Arkansas River. The plant office is also unusually attractive, and Fibreboard products were used in it wherever possible.

The "Pabco" building materials division of Fibreboard traces its origin to the year 1884, when the Paraffine Companies started operations with a small asphalt plant in Emeryville, Calif., to emulsify the residue from oil refineries nearby. The first product was marketed as P & B asphalt paint. In subsequent years the company name was changed to Pabco from the first letters in the names of the founders, Pearce and Bardsley. In the following several decades the "Pabco" product line was expanded to include asphalt roofings and roof coatings, asbestos-cement products, high-temperature insulation, paints, and smooth surface floor coverings.

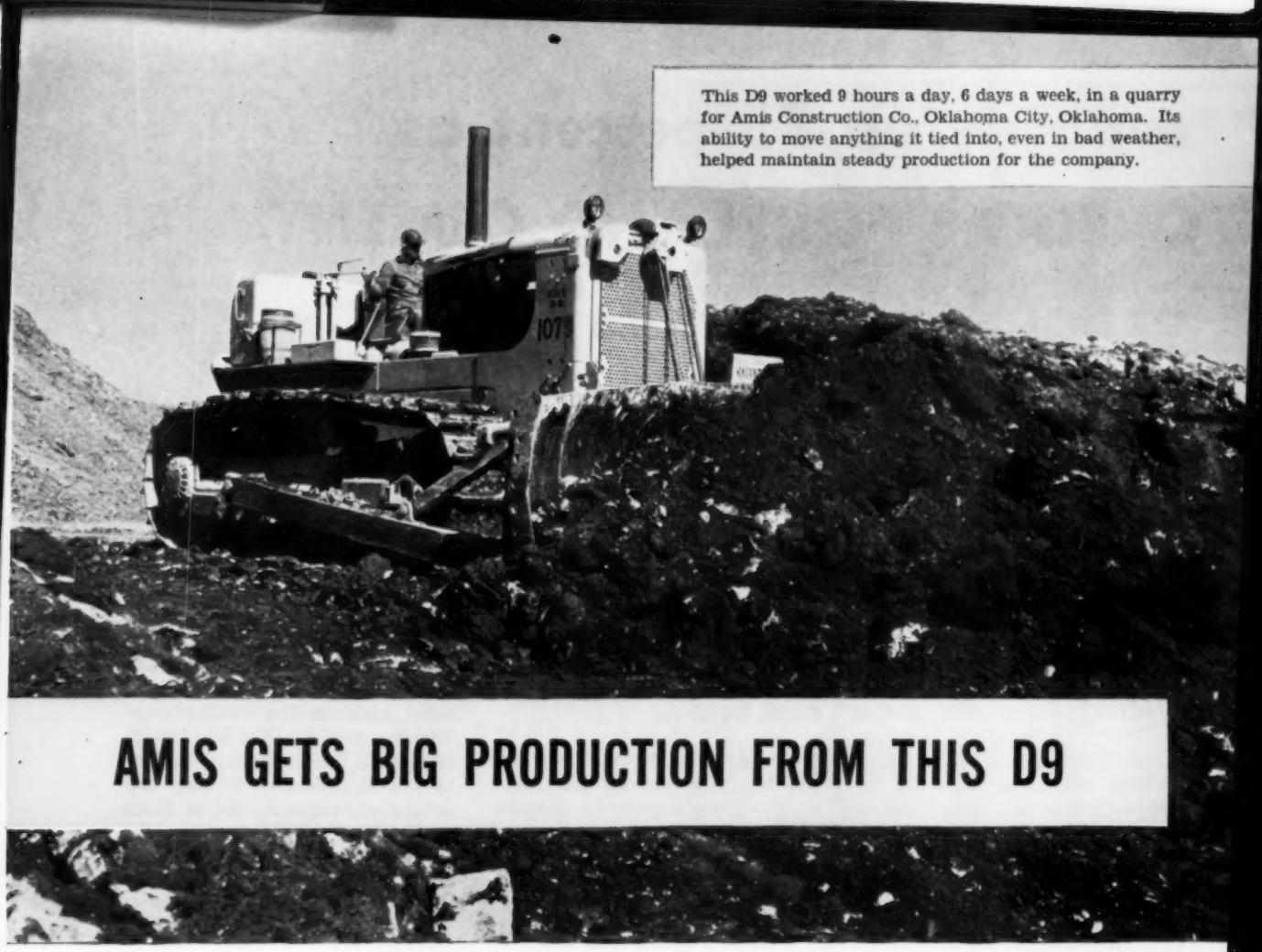
In 1956 Pabco Products, Inc., which owned a half-interest in Fibreboard Products, Inc., purchased the remaining half-interest in the company from Crown Zellerbach and thereby became owner of the leading package manufacturer in the West. The two companies were merged in December, 1956.

Principal pulp, paperboard manufacturing, and converting operations of Fibreboard are at Antioch, Vernon and South Gate (Los Angeles), San Francisco, and Stockton, all in California; Denver, Colo.; Portland, Oreg.; and Port Angeles and Sumner, Wash.

Manufacturing plants of the "Pabco" divisions are at Emeryville, Calif. (smooth surface floor coverings, paint, asphalt roofings and roof coatings, high-temperature insulations); Redwood City, Calif. (asbestos-cement products); South Gate, Calif. (gypsum products); Wilmington, Calif. (asphalt roofings and roof coatings); Portland, Oreg. (asphalt roofings and roof coatings); Newark, Calif. (gypsum products); and Florence, Colo. (gypsum products).

In addition to these facilities in the United States, Pabco Products Pty. Limited, a wholly-owned sub-

(*Continued on page 90*)



This D9 worked 9 hours a day, 6 days a week, in a quarry for Amis Construction Co., Oklahoma City, Oklahoma. Its ability to move anything it tied into, even in bad weather, helped maintain steady production for the company.

AMIS GETS BIG PRODUCTION FROM THIS D9

In a quarry northwest of Augusta, Kansas, this CAT D9 Tractor with No. 9S Bulldozer proved the mainstay of production for Amis Construction Co. Here it's stripping 6 to 8 feet of rock and clay topsoil to get to crusher rock. Along with other Caterpillar Diesel Tractors, it supplied a crusher turning out 3000 tons a day for use on construction of Sections 9 and 10 of the Kansas Turnpike. Thirty-five trucks hauled the material to the job. During bad weather, when the trucks could not haul, the rugged yellow tractors kept right on working, enabling the company to build up stockpiles.

"In my 14 years' experience with Caterpillar-built machines, I can't say anything but good," reports Harold Wilkins, General Superintendent. "We have a minimum amount of trouble with them and can always get repairs fast and right from our Caterpillar Dealer. Our operators like the machines' ease of operation and the fact that we can always move anything we tie into with them."

Big power for fast production

The Turbocharged D9 has set new production records on job after job. Its 320 flywheel HP, with 260 HP at the drawbar, means *fast* production on any kind of *big* job. Yet, heavy as the D9 is—more than 29 tons—its hydraulic boosters provide power for steering, braking and master clutch use, making the D9 easy to operate. Its in-seat gasoline starting system provides quick, sure starts. And it's easy to service. For example, oil clutch, torque converter, transmission and steering clutches each can be removed individually.

To match your needs, the D9 is available with torque converter or direct drive with oil clutch. Ask your Caterpillar Dealer to show you how this giant can step up your production and profits!

Caterpillar Tractor Co., Peoria, Illinois, U. S. A.

CATERPILLAR

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STEP UP PRODUCTION AND PROFITS WITH THE D9

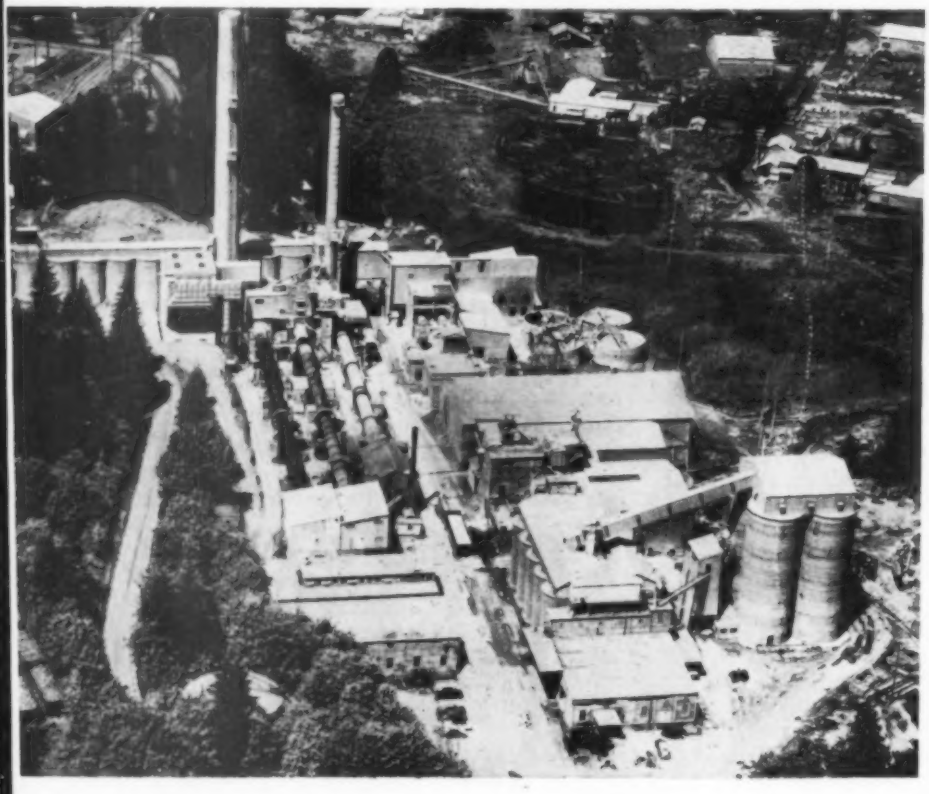
capacity up 75 percent as OREGON PORTLAND CEMENT expands two plants

By HARRY F. UTLEY

ANOTHER ON THE SPOT REPORT

OREGON Portland Cement Company early in 1957 completed a comprehensive expansion and modernization program involving its wet-process plants at Oswego, a Portland suburb, and at Lime, in eastern Oregon. An expenditure of more than 5 million dollars was involved, to increase overall capacity about 75 percent to 3,000,000 bbl. annually. This expansion establishes Oregon Portland Cement as the largest cement manufacturer in the Pacific Northwest.

Oswego Plant The Oswego plant underwent its first major enlargement program about 11 years ago, when a second rotary kiln was installed alongside the original burning unit to lift plant capacity above the 1,000,000-bbl. mark for the first time. The latest project has involved, among other additions, the installation of kiln No. 3 which, like kiln No. 2, is an F. L. Smidth 9- by 8- by 9-ft. all-welded tube 287 ft. long and integrally equipped with a Unax cooler.



Aerial view of the Oswego plant after the third kiln had been installed. Cars of limestone may be seen on spur tracks at left. The new car dumper is housed in the building in the upper righthand corner of the picture.

Besides improving the plant proper at Oswego, the company has also made extensive improvements recently at its quarry near Dallas in Polk County. The Dallas deposit supplies an intermediate grade of stone to the Oswego plant 60 miles distant, and this material is supplemented by shipments of high-calcium stone from the quarry adjoining the plant at Lime, 375 miles from Oswego by rail.

A new Lippmann 30- by 42-in. jaw crusher has gone into service at Dallas to reduce the rock to 6-in. before it is loaded into open-top cars. The new car-loading facilities involve primarily a 24-in. by 1,228-ft. tripper-equipped belt conveyor spanning a 20-car capacity spur track. By shuttling the tripper, a train of 20 cars may be loaded without moving any car.

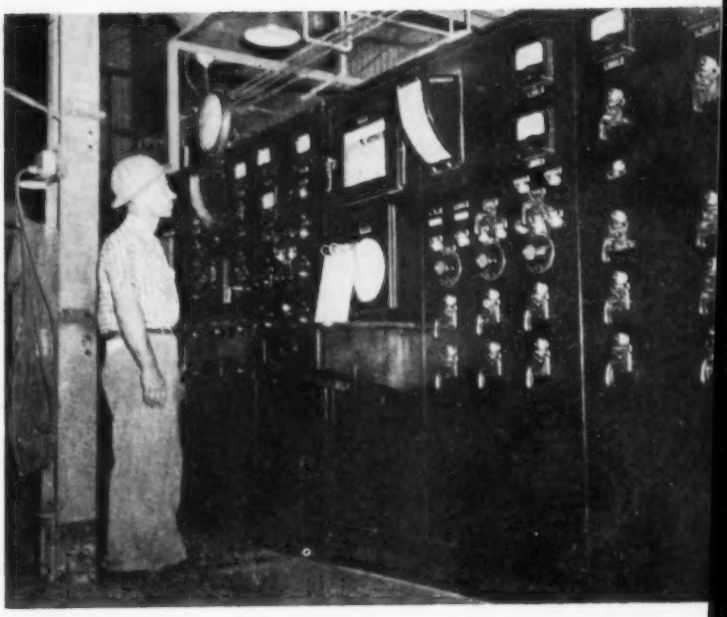
Arriving at the Oswego plant, the cars are unloaded at a fast clip by a newly-installed rotary car-dumper built by Eastern Constructors, Inc., Poland, Ohio. Unloading, besides being a rapid operation, is also carried on under practically dust-free conditions through the installation of a Johnson-March Chem-Jet fog-nozzle spray system which employs a wetting agent in the spray water for high dust-laying efficiency. Cars are moved in and out of the dumper-house by a new GE 25-ton diesel-electric locomotive.

Another improvement on the raw side at Oswego is a crushing-and-screening building where the raw material is brought down to minus ½ in. in preparation for grinding. Equipment includes a Pennsylvania 15-50 Impactor in closed circuit with a pair of El Jay totally-enclosed screens.

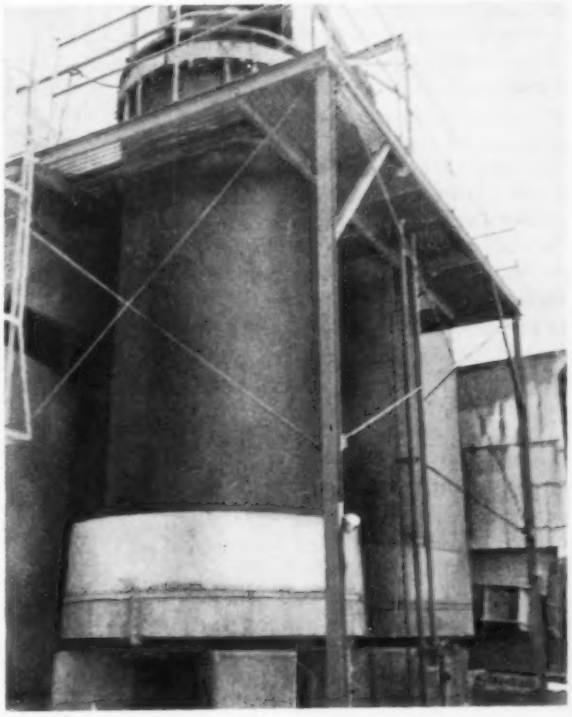
Grinding capacity was increased to handle the step-up in clinker output by installing two new 8- by 36-ft. Unidan mills, one for raw grinding and the other on the finish end.

Kiln firing is by Coen combination burners which can handle either natural gas or fuel oil. Speed of rotation on the new kiln is governed by a Dynamotor clutch between the drive motor and reducing gears, and is regulated from the kiln-control panel on the firing floor.

Dust from kilns No. 2 and No. 3 is now being recovered at 99½ percent efficiency by Cottrell electrical precipitators built by Western Precipitation Corporation. The clean gases are released into the atmosphere at a harmless altitude by a 250-ft. high Custodis-built reinforced-concrete stack.



M. F. Munch, assistant superintendent, at the Oswego plant, checks the instrument panel on the firing floor.



Another improvement at the Oswego plant was the installation of these two cement coolers.

Other improvements involved in this latest program undertaken at Oswego include two new 36- by 30-ft. slurry basins and four finish-cement storage silos, which give the plant 50,000 additional barrels of product storage. In conjunction

with the latter, two Smidth 175-bbl. per hour cement coolers were also installed.

Plant capacity at Oswego has now reached 2,000,000 bbl. annually as the result of these additions and changes, and there has been a marked gain in operational efficiency and dust reduction.

Lime Plant Because of its geographical location, the eastern Oregon plant at Lime stands to benefit in a big way from the construction of a series of new dams on the Snake River. Doubling of capacity here in 1957 was rushed to completion in record time as construction of the river improvements became a reality.

It was the first major expansion program to be undertaken at the Lime facility since the one-kiln plant first went into operation in 1923. Included was the erection of a 9-ft. 6-in. by 10-ft. 9-in. by 350-ft. kiln and a Fuller inclined-grate air-quenching cooler equipped with a clinker breaker, plus enlargement of the clinker storage and handling facilities.

Dust-arresting equipment, consisting of Multiclone collectors, was also installed between the kilns and a new 250-ft. Custodis stack. Raw- and finish-grinding capacity was increased proportionately by installing an 8- by 36-ft. Unidan mill on each side.

The new kiln has a back-end design which will permit the expected addition of a slurry pre-heater at a future date.

The earliest step in the current improvements at Lime was undertaken in 1955, however, when a new quarry and crushing plant were opened up at an elevation 735 ft. above the plant.* A 5,600-ft. downhill regenerative conveyor system links the quarry and the plant. This system is working out very effectively, the drilling-and-blasting program having recently been further improved with the addition of an Ingersoll-Rand Drillmaster unit, which permits 6¼-in. diameter "down-the-hole" drilling at the rate of 15 to 20 ft. per hr.

Administrative activity of the Oregon Portland Cement Co. is centered in the firm's headquarters building in downtown Portland. Frank E. McCaslin is president; D. H. Leche is first vice-president; and H. R. Shipley is general superintendent. Lauchlan McLean is assistant general superintendent in charge of the operations at Lime; M. F. Munch has the same post at the Oswego plant.

Oregon Portland Cement is one of the nation's pioneer cement manufacturers, having been founded in 1916. Currently there are about 385 employees and an operating payroll per year of approximately $2,000,000.

This 350-ft. kiln was installed alongside the original short kiln at the Lime (Oreg.) plant. It is served by the new multiple-cyclone dust collecting system and an inclined-grate cooler and heat recuperator.

* See PIT AND QUARRY, August, 1956, pp. 94-98.

Fibreboard

(*From page* 86)

sidiary, maintains operations in Melbourne and Sydney, Australia, where asphalt roofings, roof coatings, and paint are manufactured. Gypsum properties are at Henderson and Lovelock, Nev., and at Coaldale, Colo.

Principal officers of Fibreboard Paper Products Corporation are: William L. Keady, president; B. P. Altick, vice-president — marketing; E. W. Carey, vice-president — administration; E. W. Fish, vice-president and general merchandising manager; R. R. Galloway, vice-president and general manager — building materials division; A. S. Halley, vice-president — finance; J. F. Havard, vice-president — manufacturing; O. C. Majors, vice-president—director of sales; M. E. Sanford, vice-president and general manager, paperboard division; W. K. Spence, vice-president — personnel; J. F. Thompson, controller; J. S. Mitchell, secretary; and V. H. Erickson, treasurer. Headquarters are in San Francisco.

R. K. Comann, resident engineer throughout construction of the Florence plant, is now plant manager. Other key personnel at the Florence operation are: Jack Lix, service superintendent; E. C. Cook, board plant superintendent; C. T. Upshaw, maintenance supervisor; and T. E. Barton, quarry superintendent.

ELMER E. ELLIOT, sales manager for Western Lime Products Company, South Pasadena, Calif., died recently at the age of 58.

Pennsylvania Producers Of Highway Materials Meet in Harrisburg

PENNSYLVANIA Highway Material Producers held their annual conference in the Hotel Penn-Harris, Harrisburg, Pa., on January 23-24, 1958. The group is supported by the following Pennsylvania associations: Bituminous Concrete, Ready Mixed Concrete, Sand & Gravel, Slag, and Crushed Stone.

The conference was opened with a series of business meetings held by each of the above associations for the purpose of electing officers and conducting business which pertained to the individual organizations.

Officers elected by the Pennsylvania Stone Producers Association to serve for 1958 are as follows: president—John D. Teeter, John S. Teeter & Sons, Gettysburg; vice-president—J. Fred Coleman Jr., Bradford Hills Quarry, Inc., Downingtown; treasurer—H. M. Binkley, Binkley Bros., Inc., East Petersburg; secretary—E. J. Breneman, E. J. Breneman, Inc., Pottstown.

During the last annual meeting, it was unanimously agreed that an eight-member committee should be appointed to advise and assist the producers in the application of better methods of production and control in order to improve their product and thereby eliminate costly shutdowns due to the rejection of their aggregates. For the most part, this committee consists of former highway engineers. Their report indicated very satisfactory progress and results. The committee received full co-operation from the Pennsylvania highway testing laboratory and from the materials engineers in the field.

In keeping with this program, Howard M. Bixby, field engineer, National Crushed Stone Association, Washington, D. C., delivered a detailed report on *Proper Methods for Sampling Aggregates.*

This address was followed by a premier showing of a motion picture film produced by the Pennsylvania Department of Highways. The film depicted the proper methods of

(*Continued on page* 102)

Left: Representatives of three organizations sponsoring the Pennsylvania Highway Producers meeting (left to right): H. H. Wagner, general manager, Pennsylvania Stone Producers Association; Ray Britton, executive secretary, Pennsylvania Slag Association; and H. H. Miller, executive secretary, Pennsylvania Sand and Gravel Association and Pennsylvania Ready Mixed Concrete Association.

Right: In this threesome are (left to right): H. M. Binkley, Bradford Hills Quarry, Inc.; C. L. Weaver, John T. Dyer Quarry Company; and John D. Teeter (newly elected president, Pennsylvania Stone Producers Association), John S. Teeter & Sons.

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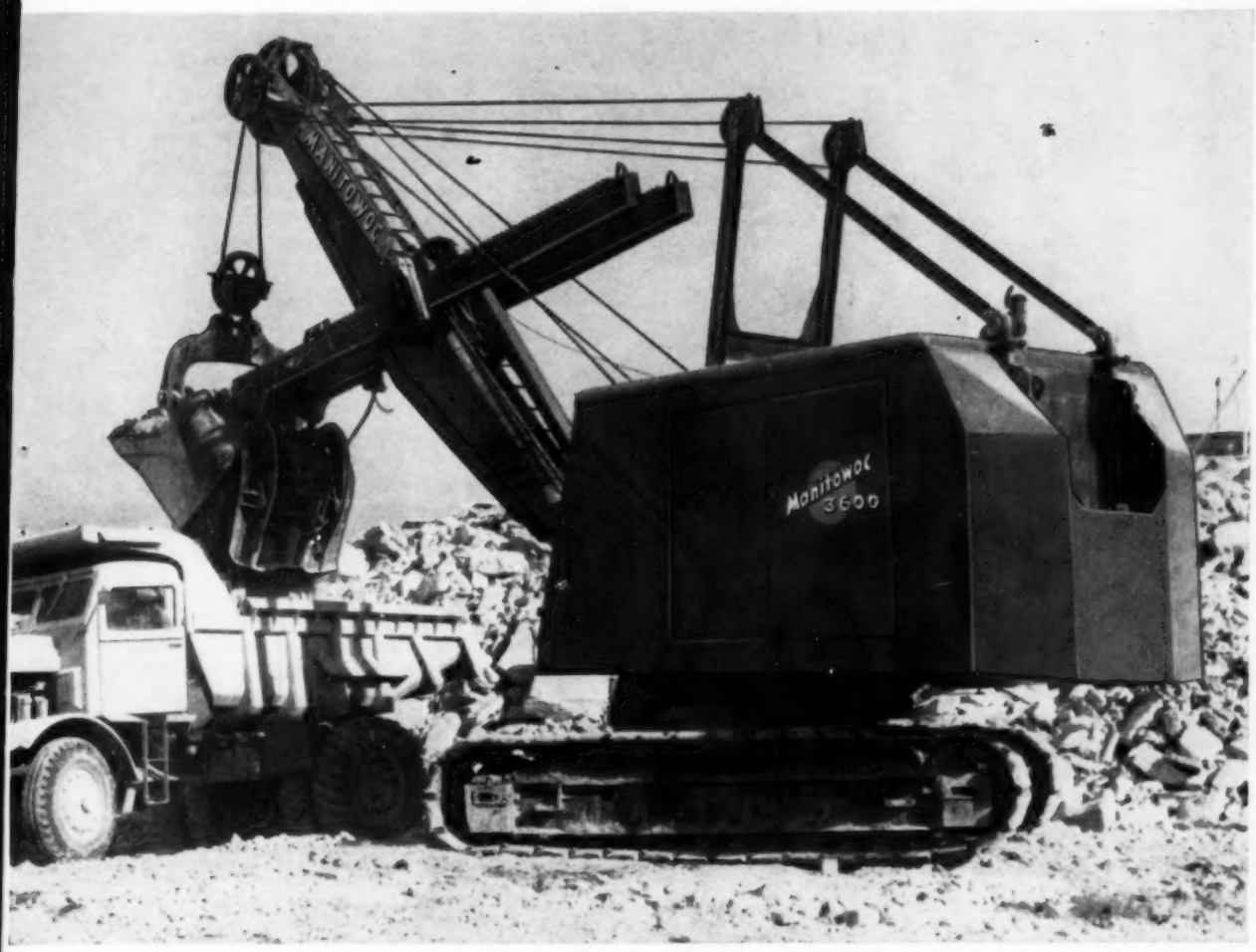
Want more digging power, more cycle speed, more output — more *profit* even from low bid jobs? Then you'll want all the facts about the big, *new* Manitowoc 3-yd. Model 3600 shovel. Here is a tough, fast unit with all the modern, big output features you need to make money in today's highly competitive market.

The new 3-yard 3600 is scientifically engineered to match modern haul units. New, high-sided hauling units require a shovel with the correct shipper shaft positioning . . . the exact dipper pitch and shape to provide higher reach and cleaner dumps. Result — faster work cycles and no loading bottlenecks.

The new 3-yard 3600 delivers full power to the dipper. Simple design eliminates power loss in the gear train . . . increases cycle speed. Here's a big machine in the high capacity class which offers the speed and responsiveness of small capacity rigs. And for smoother power transfer the torque converter system includes a "governor" to maintain rigid control of the infinite variety of power ratios. Line pull and line speed factors are balanced against load resistance, resulting in smooth, powerful operation and long machine life.

The new 3-yard 3600 makes hard jobs easy. Responsive air controls let your shovel runner perform at top efficiency all day without fatigue. Smooth-acting clutches and positive-action brakes respond instantly to the operator's touch even on the toughest jobs.



The new 3-yard 3600 stays on the job longer. Tough, internally reinforced, box-section dipper sticks; a massive shipper shaft; a tubular, alloy boom; a manganese dipper and many other long-life features keep the 3600 working longer with fewer service delays.

The new 3-yard 3600 is quickly convertible to crane, clamshell or dragline operation. You get a smooth-lifting, 65 ton capacity crane — a big-yardage, long-reach 3-yd. dragline. Simple boom connections make front end conversion in the field fast and easy.

See your Manitowoc distributor now for more facts on the new 3-yard 3600. There are dozens of other profitable features to help you step up production in your pit. Get more information *today!*

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Conveyors leading to the Fountain Sand & Gravel Co. ready-mix plant (left) and the dryer-equipped industrial-sand plant. This view is from the top of the crushing-and-screening plant.

Progressive Producer Installs New Type of Screen

By HARRY F. UTLEY

ANOTHER ON THE SPOT REPORT

FOUNTAIN Sand and Gravel Company of Pueblo, Colo., has long been a dominant factor in the aggregates and concrete industries in central Colorado. For 40 years or so, it has been excavating and processing sand and gravel from the bed of the Arkansas River, frequently improving its flow-sheet in the interests of plant efficiency, economy, and increased capacity. Currently the plant has a productive capacity of 330 t.p.h. and at least one-fourth of this output is marketed in ready-mixed concrete, the firm's batching-mixing plant on the premises being able to turn out nearly 100 cu. yds. hourly.

The concrete plant can dry-batch

The new 5- by 10-ft. gravel-sizing screen. The two angular housings contain the reaction springs which store potential energy and release kinetic energy to impart vibration.

or mix by way of a T. L. Smith 3½-cu. yd. tilt-type plant mixer and the ready-mix fleet consists of 18 Smith 6-cu. yd. truck-mixers equipped with 2-way radio. The Fountain concern is one of the nation's earliest entrants into the ready-mix business, having first ventured into this field in the middle 'twenties.

Heaviest demand on the facilities at the moment is in serving the Air Force Academy's far-reaching construction near Colorado Springs.

Nearly half the output of the aggregates plant is washed sand, and a portion of this is conveyor-fed to a special plant where a dryer and classifying equipment combine to turn out specification filter, engine, and blast sands.

Early in 1957, the need became apparent for increased screening capacity on the coarse-material side of the sand-and-gravel plant. Studying new developments in the screening art, the management elected to install one of the first Hewitt-Robins "Hi-G" screens in the industry. This 5- by 10-ft. double-deck unit alone now washes and classifies all the gravel in production—about 170 t.p.h.—into three finished sizes within the limits of ¼ to 1½ in.

This new and, in many respects, revolutionary type of screen employs principles of resonance and harmonics, and operates with a noticeable rhythmic beat. It has an opposed, 2-piece live frame with counterpoised motion and uses only a very small vibrator (or exciter) since it needs to generate only about 10 per cent of the operating stroke; the drive is a 5-hp. motor. As the exciter moves the lower frame upward and the upper frame downward along the line of motion, reaction springs connecting the frame sections are compressed, storing up energy.

After a half turn of the exciter, this stored energy is released and the two frames spring sharply apart, the opposed motion accelerating rapidly as the speed increases until the natural frequency of the system is reached.

The reaction-spring system controls the amplitude of vibration and also imparts a sharp "kick" to the frames to prevent blinding or plugging. Power cost is said to be less than half that of a conventional screen of similar capacity.

Pit-run material delivered to the plant hopper by trucks is reduced to 1½ in. top size by a jaw crusher and a set of rolls before the coarse sizes are spray-washed and sized by the Hi-G screen. The sand is processed in Shaw classifiers.

John A. Bullen, Sr., is president of the Fountain Sand & Gravel Co. and John A. Bullen, Jr., is the general manager. Herbert Snow is operations manager.

New Dipper Tooth Design

(*From page 50*)

stones are tipped to an upright position, and as the dipper is crowded into the bank, the material rolls in on the smaller stones. It has been found that dippers provided with these teeth are consistently and completely filled on one pass. Production control records kept on three Marion 4161 shovels, on which the dippers have the new teeth, show that production has increased from 5 to 25 percent.

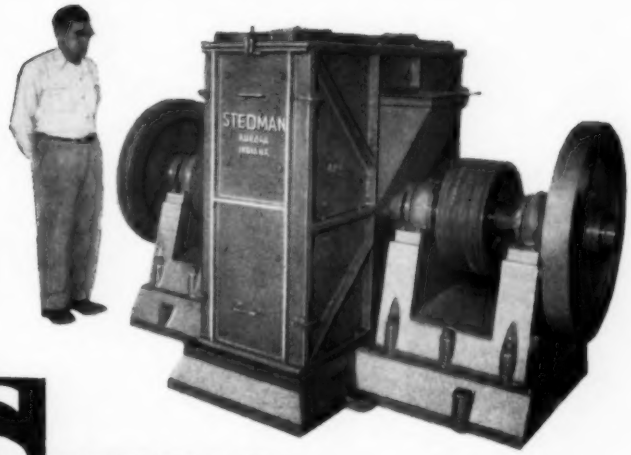
ARE YOUR STONE AND GRAVEL PRODUCTS CUBICAL IN SHAPE?

ARE THEY FREE OF SOFT STONE AND CLAY?

WILL THEY MEET SPECIFICATIONS AND PASS ABRASION TESTS?

DO YOU NEED MORE OF THE FINER SIZES IN YOUR SAND PRODUCTS?

CAN YOU MEET TODAY'S SPECIFICATIONS ON AG LIME?



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Enter 95 on card, page 239

These tandem units at the Clinton Point quarry can deliver nearly 32 tons of rock to the primary crusher each trip.

New York Trap Rock

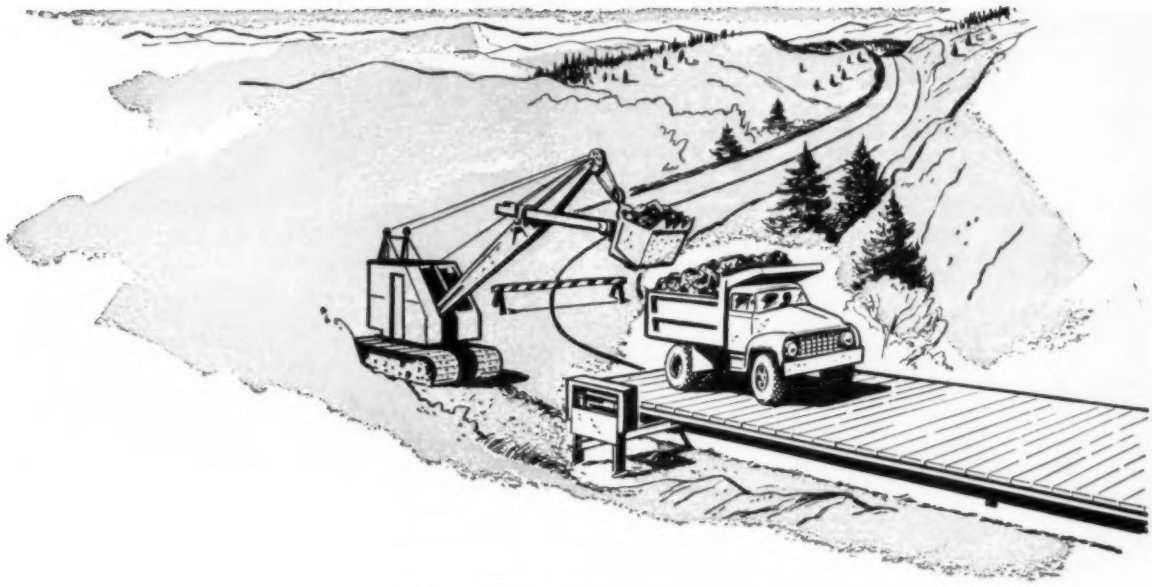
reduces operating costs

through haulage revisions

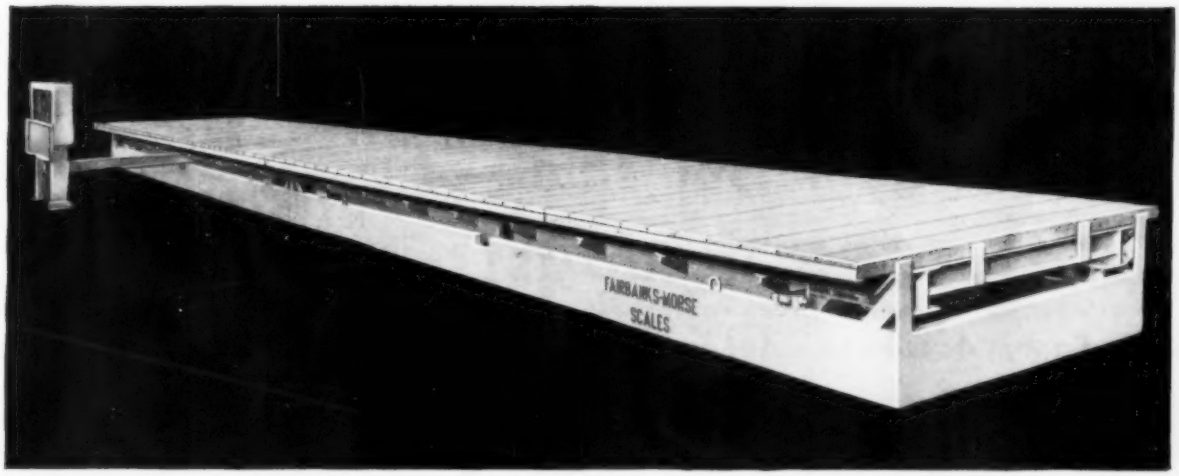
BY EFFECTING a money-saving change in quarry-plant haulage, a prominent eastern producer has diluted the atmosphere of high operating costs in which many members of the aggregates-producing industry find themselves. The New York Trap Rock Corporation, at its Clinton Point, N. Y., quarry, is now making appreciable savings through the use of tractor-trailers and full trailers in tandem. This system has been developed at the quarry during the last three years, to replace the former single unit haulage. The economies of the system have led the company to convert the present haulage at its Haverstraw, N. Y., quarry.

For many years, the ¾-mile haul from quarry to plant at Clinton

Tandem units maintain delivery of over 1,000 tons of quarry-run stone per hour.



Weigh it at the job site



Here's a portable truck scale, completely self-contained, that can be transported by truck! Designed for use in road construction, at quarries, in gravel pits and on construction sites, the new Fairbanks-Morse Portable Vehicle Scale is a completely self-contained unit made to travel on a flat bed truck. No scale pit is needed!

Just take off the wooden platform panels, disconnect the transverse lever and tighten the hold-down bolts—and you have a package eight feet wide, legal to ride the highways.

Units can be used singly or connected in tandem to the same registering beam or dial. Standard models are available in eight lengths to 60 feet and in capacities of 30, 40 and 50 tons.

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Point has been made with Easton side-dump semi-trailers. In 1955, on an experimental basis, an Easton unit with a converter dolly was acquired and set up as a tandem rig. Results led to the purchase of three more units in 1956, and at the present time a total of 10 units are in operation. Nine units are in continuous use, and one is kept as a standby.

Most of the savings realized have come about through the fact that one tractor does the work of two. George White, Clinton Point quarry superintendent, points out that a delivery of over 1,000 t.p.h. of quarry-run stone to the primary crusher is maintained, using the Easton tandems—some of which have 10 cu. yd. and others 13 cu. yd. bodies.

Company officials and engineers found few problems in the changeover from the former to the present haulage system. There were no problems in the engineering sense, according to Mr. White, since the newer pieces of equipment are side-dumps, as were the older, and the primary crusher house was already fitted with a tipper hook and crane.

Clarence F. Stetser, general superintendent of operations for New York Trap Rock; George W. White, Clinton Point superintendent; and Sam D'Onofrio, supervisor of community public relations (left to right) look over the plant's impressive safety records.

The safety record of these operations, another primary concern, has proven more than satisfactory. The equipment in use is described as well balanced, and the body design is such that the minimum of spillage in loading, and none in transport, is realized.

As seen in the accompanying photographs, the semi-trailer and full trailer units are identical—a standard semi-trailer unit was made a full trailer by the installation of a converter dolly. These bodies may be dumped to either side by means of lifting bails welded on both sideboards. At Clinton Point, the standard dumping is to the left.

Located on the east bank of the Hudson River near New Hamburg, the Clinton Point quarry is excellently situated with respect to metropolitan New York markets, and has the added advantage of being able to utilize water transport, which is also available to the firm's other operations. For that purpose, New York Trap Rock maintains a fleet of 210 vessels (see PIT & QUARRY, July, 1957, p. 191). In order to keep this fleet moving to supply market demands, the quarry haulage is an initial and prime factor in the overall operation.

Net earnings of the Dewey Portland Cement Company, Kansas City, Mo., were $2,538,725, equal to $1.41 a common share for 1957, compared with $2,591,244 or $1.45 a share in 1956. Sales in 1957 were $14,434,734, the largest on record, as against $12,685,516 in 1956.

For the year 1957 Marquette Cement Manufacturing Company, Chicago, Ill., reported a net income of $7,306,933, or $2.71 per common share, compared with $7,376,467, or $2.47 per share, in 1956. Receipts totaled $48,075,579 in 1957, against $43,948,375 in 1956.

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Poidometers provide long-term, continuous, economical service in weighing, feeding, mixing, blending, recording and proportioning. They insure higher tonnages and better product uniformity.

Now available with remote controls for showing and changing feed rate, and total weight recorders.

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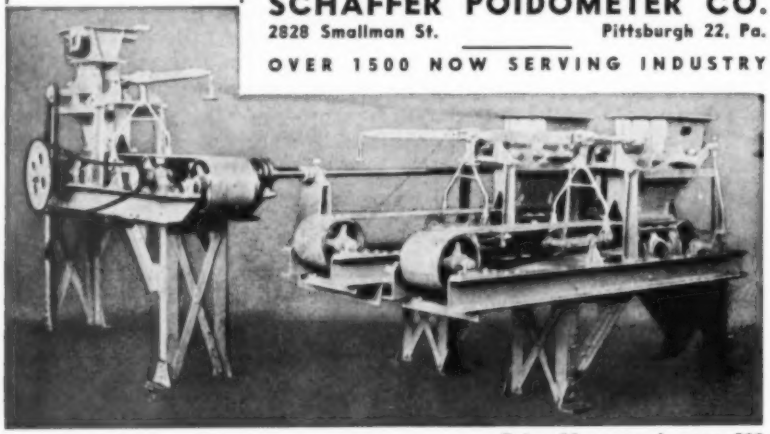
2828 Smallman St. Pittsburgh 22, Pa.

OVER 1500 NOW SERVING INDUSTRY



Enter 98 on card, page 239

Labor Developments

(*From page 72*)

"On November 6, 1954, at about 6 a.m., the *Kishwaukee* (the tow boat involved), lashed to its sister vessel the *George W. Banta,* and the four barges began moving across the river to Peddie's Landing, where the union picket line was operating. Captain J. W., Captain Burt and those of the crew not engaged in operating the boats lined up on the lead barge. Captain J. W. instructed those about him to 'shoot to kill' if their lives were in jeopardy, otherwise to aim at the arms and legs.

"As the two boats and barges approached, from 12 to 20 pickets crossed from the shore to Huskey Barge No .70, which was moored in the fleet.

"When the two groups were about 50 ft. apart, Captain Burt ordered his nephew Ernest to fire the shotgun at . . . Knapp (a union representative). The nephew did not shoot immediately, and shortly thereafter the group started firing. Three rounds were fired from the shotgun, and from 15 to 40 rounds from the revolvers. Knapp hid behind a nearby capstan. Six or eight revolver shots hit the capstan and finally a revolver bullet hit Knapp in the left arm . . ."

This is the kind of open warfare which one no longer expects in labor - management relations. The significant fact is that it does happen; and when it happens, we are brought face to face with the realization that bad labor relations can still develop a degree of tension which is inconsistent with civilized inter-relations.

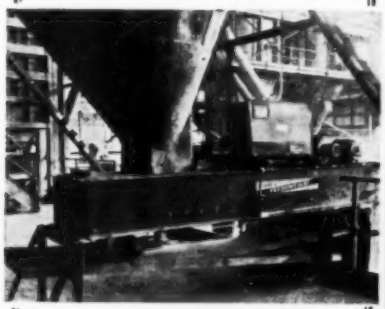
Extra-legal Involvements Because labor relations necessarily involve direct conflict between opposing forces, both of which can generally command substantial power, there is always the danger that they will try to augment that power by the use of illegal means and by alliances with illegal, gangster, groups. Such groups are generally more than willing to become involved with respectable fronts, whether they be companies or unions. The record shows that once the association is formed, it is almost impossible to disengage such elements.

Successful disengagements have occurred, however, in a few instances. The best known of them is the attempt of the International Ladies Garment Workers Union to rid itself of gangster influences which were able to penetrate rather successfully during the 1920's. A bitter struggle ensued. The very disengagement involved substantial violence, but, apparently, the union was successful. However, maintaining that position has involved continued vigilance.

To be sure, when *employers* resort to the use of illegal methods, they provide the unions with ready-made reasons for engaging in similar activities. Employers, too, have had difficulty in disengaging themselves.

The current proposals for changes in labor legislation touch hardly at all on this problem of violence. Substantial improvement in the current situation will be possibly only if the proposed new reporting requirements force the parties to reveal their total connections and if that information is used by the law-enforcement agencies.

You're Sure with Merrick



FOR Positive Controlled Feed by Weight of Sand Gravel, Lime Clinker, Gypsum or other materials to Process—

Use the Feedoweight

Merrick Scale Mfg. Co.
Passaic, New Jersey

Enter 99-A on card, page 239

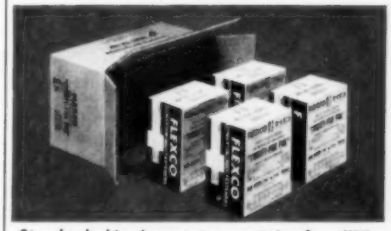
NEW FOR YOUR CONVENIENCE...

FLEXCO "25-PAK"

TWENTY-FIVE COMPLETE SETS OF FLEXCO HD BELT FASTENERS NOW AVAILABLE IN ONE EASY-TO-HANDLE ECONOMY BULK PACKAGE

There's no need now to carry several 10-set boxes to the job—every "25-PAK" contains 25 complete sets of FLEXCO Fasteners (bottom plates, top plates, clips, nuts and bolts) . . . enough FLEXCO Fasteners to join common belt widths (for example: one "25-PAK" box, size 1½E, will join a 36" belt.) Our savings from bulk-packaging are passed on to you!

Label on each "25-PAK" box has chart indicating the number of FLEXCO HD Fasteners to use for given belt widths.



Standard shipping carton contains four "25-PAK" boxes of one size fastener. Keep a supply of "25-PAKS" on hand. Easy to store and inventory, sturdy boxes and shipping cartons have many uses.

Ask your FLEXCO distributor or write to us for additional information.

Flexible STEEL LACING COMPANY

4623 LEXINGTON ST. • CHICAGO 44, ILL.

FOR THE SPLICE OF A LIFETIME

Enter 99-B on card, page 239

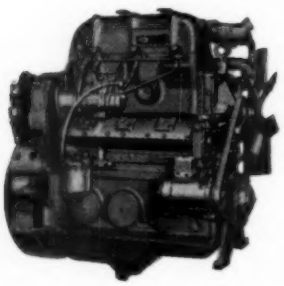
"Power to really dig in and do a day's work"

Mr. Wulf, general manager of Monmouth Trucking Company Sand and Gravel Pit, is enthusiastic about his P&H Diesel powered ¾-yard P&H 255A shovel. You hear reports like his everywhere about the P&H Diesel. It consistently makes good equipment perform better and results in less downtime for maintenance.

Until Harnischfeger developed the P&H Diesel, owners had to be satisfied with diesels which did not fully utilize all the potential of their equipment. But now, P&H Diesels have changed this situation with:

- **better response, faster starts, better idling than any other make of diesel**
- **delivers more power with less fuel—uses low-cost No. 2 diesel fuel**
- **25% fewer working parts and all wearing parts are interchangeable**
- **compact design results in easier maintenance—smaller parts stock**

For all of your equipment—including crushers, front end loaders and other portable equipment—specify the one diesel with all the features that deliver top performance—P&H Diesel. P&H Diesel Engine Division, Crystal Lake, Illinois.



P&H DIESELS

Fastest Growing Name in Diesel Power

Appointments and Promotions

MELVIN H. BAKER JR. has been appointed sales manager for the Albany (N. Y.) sales district of the National Gypsum Company, Buffalo, N. Y. He was formerly assistant manager of the company's sales district in Jacksonville, Fla.

JAMES C. HICKS has been appointed director of research of the Milpitas (Calif.) laboratories of Kaiser Chemicals, a division of Kaiser Aluminum and Chemical Corporation, with headquarters in Oakland, Calif. He was formerly director of refractories research at Milpitas.

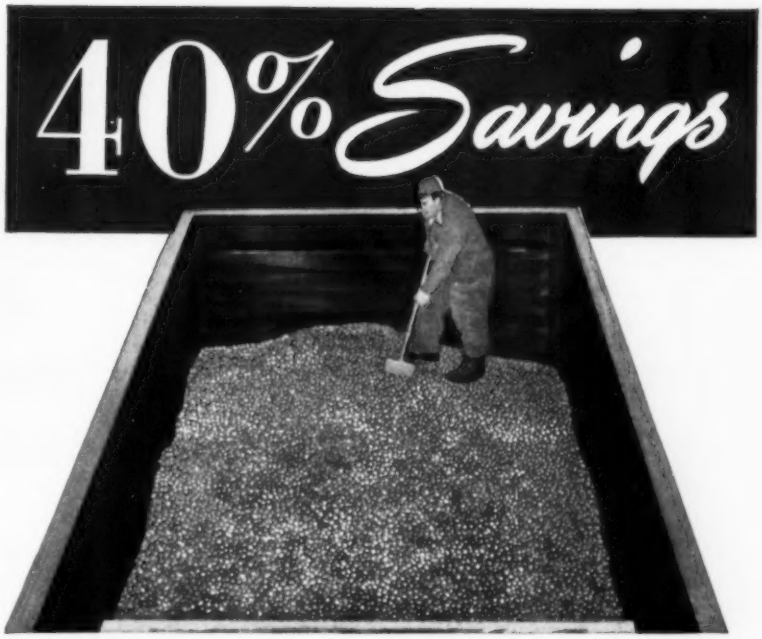
Research facilities at the Milpitas laboratories were expanded to permit the consolidation of the division's basic refractory and magnesia research activities. The magnesia research group has been moved to Milpitas from Moss Landing, Calif.

DR. HERMAN GUNTER, state geologist and director of the Florida Geological Survey, Tallahassee, for more than 39 years, has retired. Dr. Gunter has been a geologist with the Survey since its organization in 1907.

Appointed to succeed Dr. Gunter effective April 1, 1958, was DR. ROBERT O. VERNON, assistant state geologist and associate director, who has been with the Survey for 18 years.

ROBERT D. STEPHAN, former vice-president in charge of dealer sales, has been elected vice-president in charge of sales, United States Gypsum Co., Chicago.

ROBERT B. FISHER, formerly assistant to the vice-president of dealer sales, has been appointed central division sales manager by the United States Gypsum Company, Chicago, Ill. Since joining the company in 1947 in Denver, Colo., he has held various positions in the firm's sales organization.



ACHIEVED WITH CALUMET NI-HARD* GRINDING BALLS

A full year of on-the-job tests proved that, in wet grinding of copper ore, Calumet Ni-Hard grinding balls offered more than 40% reduction in grinding ball costs per ton of ore ground. In dry grinding, equally impressive results were shown.

These are the grinding balls developed to meet Calumet's own requirements for abrasion resistance and lowest possible grinding costs. Through careful quality control and laboratory testing, all Calumet Ni-Hard grinding balls provide the uniformity that will assure you of exceptionally satisfactory use in your grinding operations.

Calumet Ni-Hard grinding balls are available from stock in the following sizes: 5/8", 3/4", 7/8", 1", 1 1/4", 1 1/2" and 2". Complete information is yours for the asking. Write TODAY.

*Reg. U.S. Pat. Off., Intl. Nickel Co., Inc.

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Enter 101 on card, page 239

Pennsylvania Producers

(*From page 91*)

lifting samples of all types of highway maintenance and construction materials.

Aggregates producers were told by the highway department that several experimental highway construction projects would be built using dense base plant mix stabilized aggregate for the base course construction. Leonard S. Fry, president of Fry Coal & Stone Co., Mercersburg, who had some experience in Maryland with this type construction, used a series of projection slides showing each step in that type of project.

The Thursday business session was followed by a cocktail party and banquet under the direction of Messrs. Ray Britton (Slag Association), H. Hershey Miller (Sand and Gravel and Ready Mixed Concrete Association), and H. H. Wagner (Crushed Stone Association).

Seven Pennsylvania and federal officials addressed the audience on January 24. They included the following: Hon. George M. Leader, governor of Pennsylvania; the Hon. Roy E. Furman, lt. governor; Lewis M. Stevens, secretary of highways; Robert A. Farley, chief engineer, Pennsylvania Department of Highways; George N. Wade, chairman of the state senate highway committee; Francis C. Witkoski, director of research and testing, Department of Highways; and John L. Stinson, district engineer, of the Federal Bureau of Public Roads.

Four producers attending the meeting were (left to right): L. S. Fry, Fry Coal and Stone Company; H. W. Lynn, Stone & Slag Division, Bethlehem Steel Corporation; H. H. Wagner Jr., Adams Agstone, Inc.; and Chet Burn, L. B. Smith, Inc., Camp Hill.

Subjects discussed by the officials included such topics as efficiency in state government, types and mileages of highway construction which are under plans for the immediate future, and production and delivery of highway construction materials which will be required for 1958.

Among the impressive quantities of highway materials, the following were included: sand — 2,253,863 tons; coarse aggregates — 14,896,658 tons; bituminous concrete — 2,847,762 tons; and portland cement — 5,515,672 bbl.

From a careful analysis of the estimated figures, Pennsylvania will require approximately the same amount of maintenance material consisting of liquid bitumen and fine sizes of coarse aggregates. The estimates show a marked increase in the number of barrels of cement which will be required. The larger sizes of coarse aggregates—Pa. 2B, 3A and No. 4's—remain approximately the same.

This highway material producers conference attracted the largest attendance of any such meeting held in Pennsylvania up to this time.

The program committee arranged to hold the 1959 conference on January 22-23, 1959, in the Hotel Penn-Harris, Harrisburg, Pa.

Obituaries

Eugene Blum, chairman of the board of directors of the Coplay Cement Manufacturing Company, Coplay, Pa., died recently of a heart ailment at the age of 93 years.

Mr. Blum came to the United States from Germany in 1882. He became associated with Coplay Cement in 1920 as president and chairman of the board. In 1942 he relinquished the active duties of the presidency.

ROBERT F. GRAHAM, 58, president of the West Roxbury Crushed Stone Company, West Roxbury, Mass., died recently at a local hospital, after a long illness.

ADAM JOHN MILLER, manager of the Green Bay Cement Division of Pittsburgh Coke and Chemical Company, Pittsburgh, Pa., for 25 years, died recently at the age of 74. Mr. Miller retired from active service in 1954.

ROBERT S. ADAMS, plant manager of the Beachville operation of Gypsum, Lime and Alabastine, Canada, Limited, Beachville, Ont., died recently at the age of 65. Mr. Adams joined the company in 1929 as superintendent of the Elora plant, and held various important positions until the time of his death. He was very closely associated with the growth of the Beachville plant during the last 18 years, and was the editor of two papers concerning the development of the hydrate plant and shaft kilns.

FREDRIC PICKFORD, 62, secretary of the Medusa Portland Cement Company, Cleveland Heights, Ohio, for 22 years, died at his home in Cleveland Heights. He served Medusa for 46 years.

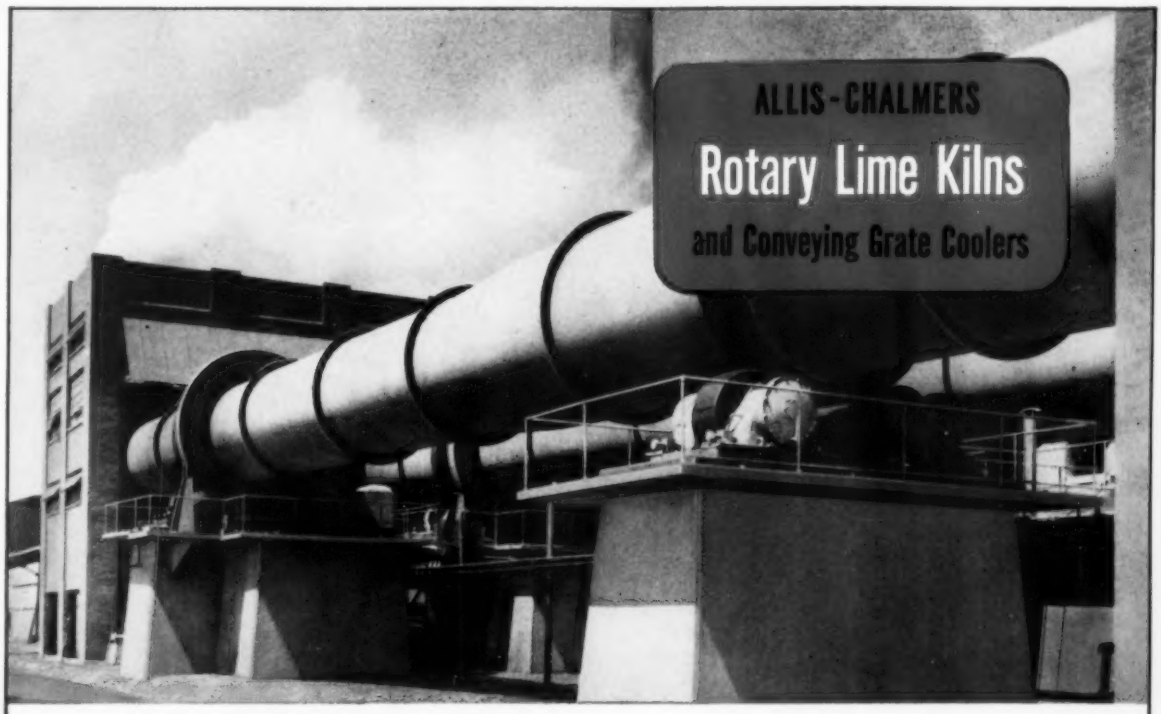
WILLIAM C. BASTIAN, plant superintendent for the United States Gypsum Company, Chicago, Ill., for 33 years until his retirement in 1955, died recently at the age of 72 in Cleveland, Ohio.

LOREN F. JOHNSON, owner and operator of the Johnson Sand and Gravel Company near Spring Valley, Ohio, died of a heart attack at the age of 43.

TWENTY-FIRST ANNUAL LIME and
AGRICULTURAL LIMESTONE SECTION

MAY 1958

PIT and QUARRY



PROFITABLE for LIME PRODUCTION...

Allis-Chalmers rotary lime kilns and grate coolers are an unbeatable combination for dependable, uninterrupted service . . . and low cost lime production.

- Vibrating Screens
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Sales Offices in Principal Cities in U.S.A. Distributors Throughout the World.

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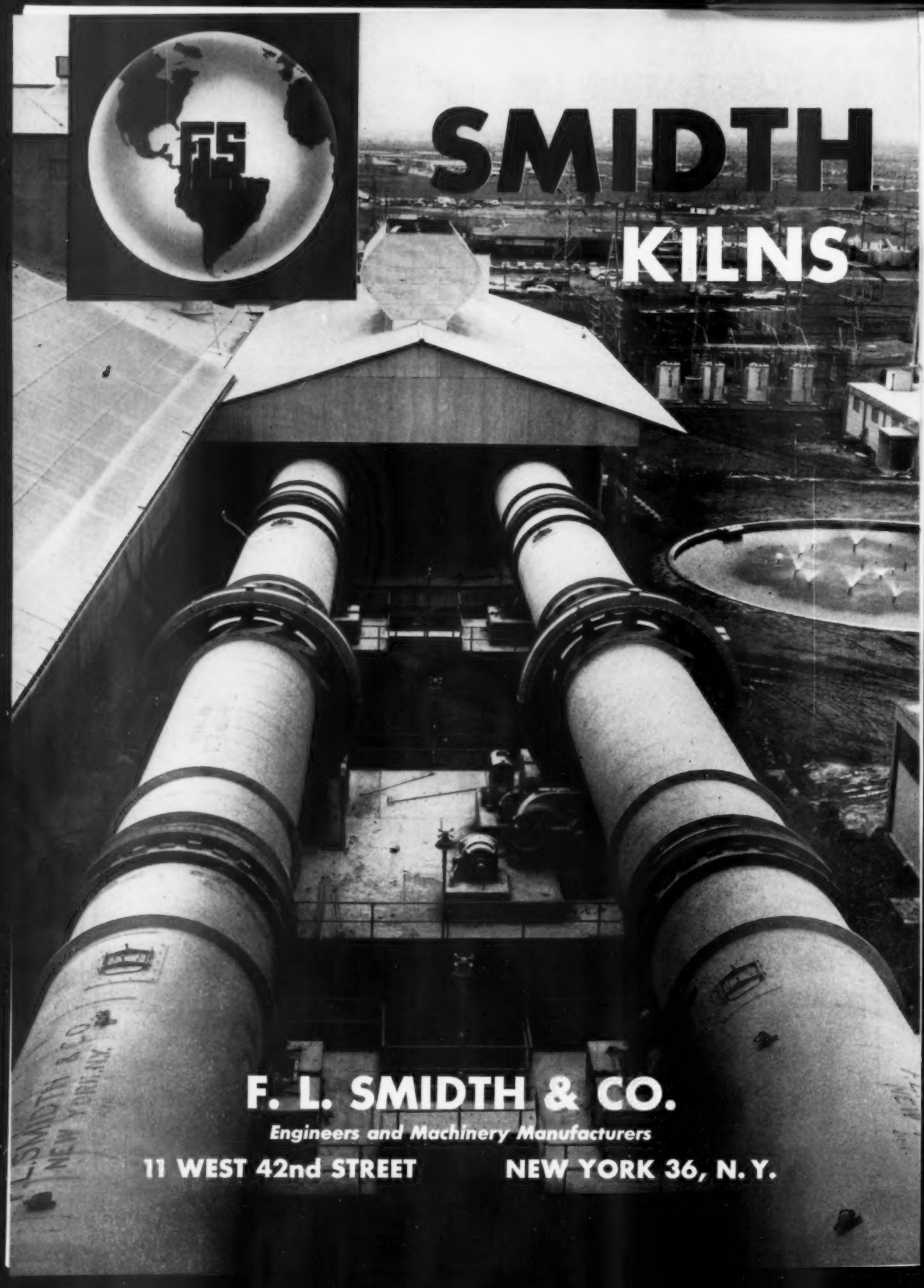
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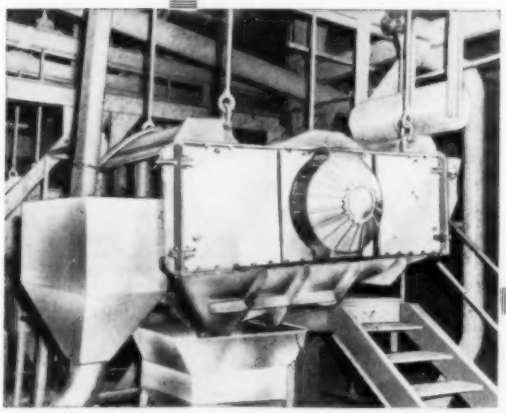
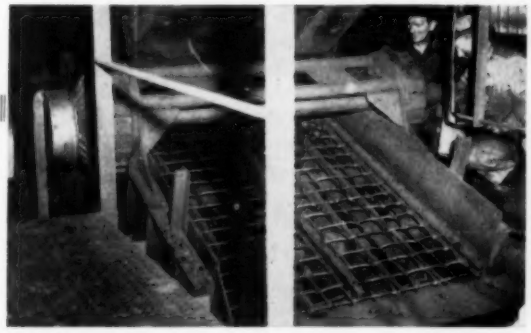
Why GYROSET SCREENS are Money-Makers!



Suspended Gyroset 3′ x 6′ scalping oyster lime slurry at 1/8″ opening, for a large cement company.

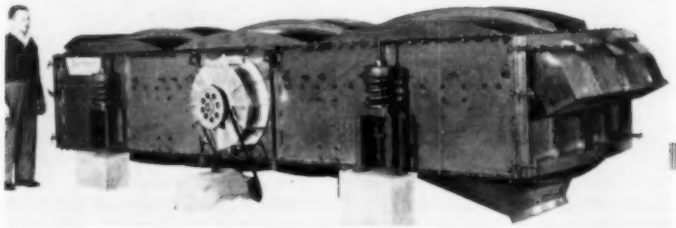
• • • • *uniform sizing*

5′ x 8′ special scalping screen with abrasion resistant liners—5″ opening.



• • • • • • *lower costs*

Enclosed unit for fine dusty screening.



• • • *increased output*

GYROSET-equipped plants are "all set" to achieve peak screening efficiency in 1958.

The positive eccentric action of GYROSET Screens gives a full circle throw over the entire screen surface. With only two bearings, the eccentric action has the fewest moving parts.

GYROSET Screens are equally effective for sizing slurry scalping, washing or dewatering. They can operate at any degree of pitch (or slope). Easily adjustable for maximum output when rough scalping. Can be set for top efficiency in grading or dewatering with output exceeding any other screening unit. Stroke adjustable from 0 to 3/8″.

Enclosed unit for fine dusty screening such as finished cements, fine ground stone, lime, etc.

These machines are simply but ruggedly built, and adaptable in action. Sizes available: 36″ to 72″ wide, 4′ to 16′ long, one to three decks.

Write today for full details

GYROSET Advantages

- ► Positive Eccentric Action
- ► Positive Stroke Adjustment
- ► Only 2 Bearings
- ► Heavy Structural Shaft Housing
- ► Center line of bearing and fly wheel close to side sheets for minimum overhang.
- ► Taper lock fly wheel bushing for assured tightness and ease of maintenance.

PRODUCTIVE EQUIPMENT CORP.

2924 W. LAKE ST., CHICAGO 12, ILL.

"...tops in ag-lime equipment"

"We have been using your Lippmann Pulverizer since 1946 and we like it so well that we thought we'd let you know about it. It has given us production as high as 100 ton per hour with exceptionally good wear service. We are producing Ag-Lime with your machine and we are getting almost 100 per cent production of this product. We've never had a breakdown, and only just recently replaced the rotor for the first time. In our opinion your Pulverizer (32x24) is top Ag-Lime equipment."

(Signed) ELMER BECKER
BECKER AND TUCKWOOD
Lancaster, Wis.

LIPPMANN
AG-LIME PULVERIZERS

"Good production... excellent wear service" says Robert Ivey

"Our Lippmann Pulverizer has been working so well for us that we thought we would tell you how completely satisfied we are with it. While it is only an 18" (32 x 18) wide machine we still get 80 tons of ag-lime from it per hour. That in our opinion is real production. Besides, we have not had a bit of trouble, so in addition to getting good production we are getting excellent service wear as well."

(Signed) ROBERT IVEY
IVEY CRUSHING & CONSTRUCTION CO.
Mineral Point, Wis.

There are good reasons why Lippmann Pulverizers get enthusiastic endorsement everywhere they are used. Upswing hammer efficiency gives more impact to break stone faster, eliminate drag and reduce abrasive wear. Heavy, solid steel flywheel and dynamically balanced rotor provide greater momentum, reduce vibration and conserve power.

Non-choking steep feed chute, small uniform hammer clearance and special angle breaker plate design all add to the production capacity of these Pulverizers. Special hammer design, tough forged hammer arms, oversize bearings and shaft provide longer wear service. Remember too, Lippmann Pulverizers produce just about 100% minus 8-mesh ideal ag-lime product — another reason for their wide popularity.

Bulletin 1160 contains many other reasons why Lippmann Pulverizers (sizes range from 24 x 12 to 40 x 36) are tops with ag-lime producers. Get your copy and full information from your local Lippmann Distributor, or write to Lippmann Engineering Works, Inc., 4607 W. Mitchell St., Milwaukee 14, Wis.

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CRUSHERS FEEDERS SCREENS CONVEYORS CRUSHING & WASHING PLANTS

Iowa Aglime Producers Hold 13th Convention

THE latest of the Iowa Agricultural Limestone Association's highly regarded annual conventions —the group's 13th—was held on March 5 and 6 at the Hotel Savery in Des Moines, Iowa. Quality of the business program and companion social functions is attested to by the consistently high attendance figures. This year more than 360 members and guest were registered.

As in past meetings, a number of state and federal representatives were on hand, as well as leaders of national organizations. Among the distinguished guests and speakers were the governor of Iowa, Herschel C. Loveless; Dewey Cornell, state ASC committee program specialist; Dr. E. R. Duncan, extension agronomist of Iowa State College; Dr. W. H. Pierre, head of the college's agronomy department; Robert M. Koch, president of N.A.L.I.; Ralph Kalberloh, manager of the Missouri Limestone Producers Association; Frank Mendell, state conservationist; and all members of the executive council of the state of Iowa.

At the close of the business sessions, the board of directors met to elect association officers for 1958. Robert E. Frampton, E. I. Sargent Quarries, Inc., was named president, succeeding Walter A. Schemmer, Schemmer Construction Co. Newly elected as vice-president was Tom L. Robinson, Missouri Valley Limestone Co., who succeeds Mr. Frampton to that post.

The following men were also nominated and elected to three year terms on the board of directors: Calvin B. Moore, Concrete Materials and Construction Co.; Joseph Madlom, Madlom Brothers; and Joe Wenke, Wenke Quarry.

Following the annual directors' luncheon on the opening day, members of the nominating, auditing, and resolutions committees met for transaction of business. General sessions were held on the next day, opened by reports of the group's executive secretary, Clint A. Allen, and the various committees.

It was recommended that a resolution calling for continuance of the ACP appropriation at the same proportion as established for the past fiscal period be forwarded to members of appropriate congressional agricultural committees. The resolution emphasized the need for application of greater amounts of aglime to the soils of Iowa, as well as other states, in furthering proper soil conservation.

Specific factors in the relationship of aglime and soil conservation, and of results of agronomy investigations were pinpointed by Mr. Cornell and Dr. Duncan. The former spoke on *Limestone's Part in Conservation,* and the latter on *Crop Yields—What Do You Think?* Sales and promotional efforts were discussed in a humorous but thought-provoking presentation by Joe Berger, St. Louis sales executive.

The full business program was well rounded out by an enjoyable social schedule. On the first evening, an annual entertainment feature—the Limelights of 1958—was presented following a reception. Closing the two-day meeting was the popular annual buffet dinner and ball sponsored by the organization's associate members.

Left: R. E. Frampton, E. I. Sargent Quarries, Inc., president-elect; and Tom Robinson, Missouri Valley Limestone Co., new vice-president.

Right: Three-year directors are: Joe Wenke, Wenke Quarry; Joseph Madlom, Madlom Brothers; and Calvin B. Moore, Concrete Materials and Construction Co.

old plant makes way for new as

Kentucky Firm Ups Agstone Output

By BUREN C. HEROD

Left: Elmond Gary, who heads the new Bowling Green operations. His brother Hayward supervises the older plant at Sugar Grove, Ky.

Below: Clean lines of design, as well as general good housekeeping, are readily apparent in this overall view of the Gary Brothers' new Bowling Green plant. At the extreme left is the air separator recently added for processing of the smaller fractions.

ANOTHER ON THE SPOT REPORT

AN unusually clean and compact 300-t.p.h. crushed stone operation near Bowling Green, Ky., is an interesting testimonial to the efforts of two brothers—Elmond and Hayward Gary. These two men, who started out in the crushed stone industry in 1931 as youngsters in the employ of another producer, formed the Gary Brothers Crushed Stone Company in 1947, and now have two plants —one at the above city, and another at Sugar Grove, Ky.

Designed by the two brothers, the new Bowling Green plant was erected two years ago to provide a more efficient and greater production of agstone and aggregates than was available from an older, predecessor facility. In fact, the original smaller plant at this location, that had only a nominal agstone output, was torn down and replaced by the present modern operation to attain the above goal.

The need for greater output to meet heavier agricultural and aggregate demands was one of two primary factors leading to the construction of this plant. The other was the owners' desire to be able to make several different products simultaneously, as opposed to the previous operation, which required stockpiling of certain fractions, frequent screen changes, and subsequent re-introduction of stockpiled

This drill puts down 2-in. primary blast holes. Blasting is usually done in the evening, and a high fragmentation has been experienced.

material into the flow for production of other sizes. Consequently, the new plant was designed with a capacity nearly twice that of its predecessor, incorporating a flow that allows the production of at least six different sizes, including agstone materials, in one pass.

Dry classification of agstone was recently provided through the addition of an air separator to the processing equipment. The materials produced are marketed throughout one entire county, plus adjoining areas, to meet agricultural and commercial construction needs, as well as those of state, county, and municipal agencies.

With the exception of a concrete masonry building housing the central power distribution center, all structures and equipment of the five main processing phases — primary crushing, scalping and secondary crushing, tertiary crushing, finish screening, and air classifying—are installed in a straight line. In addition to the design simplicity, other items contribute to the sharp, uncluttered appearance of the operation. Only the utility drops to the power center are suspended between poles; all other lines distributing power to the various phases are run through underground conduit.

Another factor, often ignored but having money saving potential, is the excellent housekeeping in evidence. This is not confined to the plant site, but is a regular program put into effect everywhere, from the quarry floor to the truck scales.

The new quarry was opened in a tract containing more than 50 acres of high-grade limestone analyzing at over 98 percent calcium carbonate equivalent. The same high quality has been found to a considerable depth below the present 75- to 100-ft. quarry face. Currently, quarrying is carried out at 10- to 30-ft. bench intervals. A nominal amount of overburden is removed in the fall over an area equivalent to that required by one year's face advance. This is handled by the regular quarry shovel and haulage trucks.

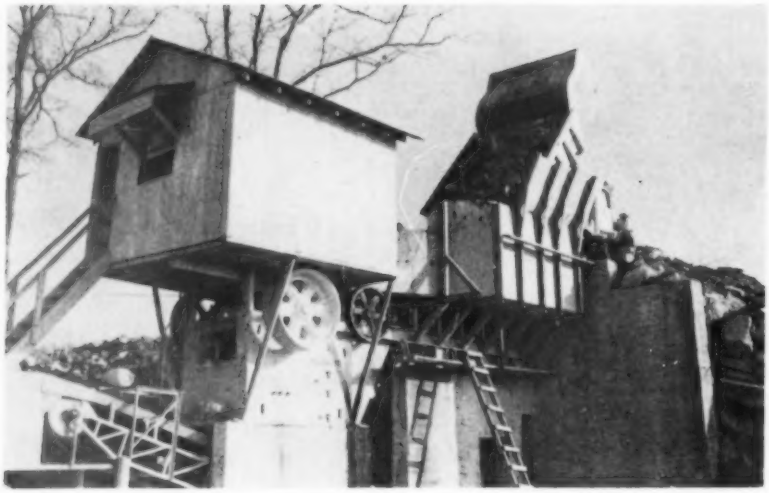
Quarrying on the upper bench. Overburden is removed during the off season over an area that will provide material for about one year of face advance.

Primary blast hole drilling is done with a Gardner-Denver wagon drill provided with air by a GD 500-compressor. Equipped with 2-in., 90 deg. Timken cross bits the drill puts down 2-in. holes on a 7- by 8-ft. pattern. Contributing to the favorable bit life footage ratio realized is the fact that very little silica or flint is found in the limestone formation.

The holes are charged with DuPont 40 percent explosives and the blasting is usually done in the evening. An excellent fragmentation is realized and on the average a yield of 3 tons of stone per pound of explosive is attained. Elmond Gary, who operates this plant, indicates that blasting for maximum effect more than pays for itself due to the subsequent minimum down-time recorded at the primary crusher.

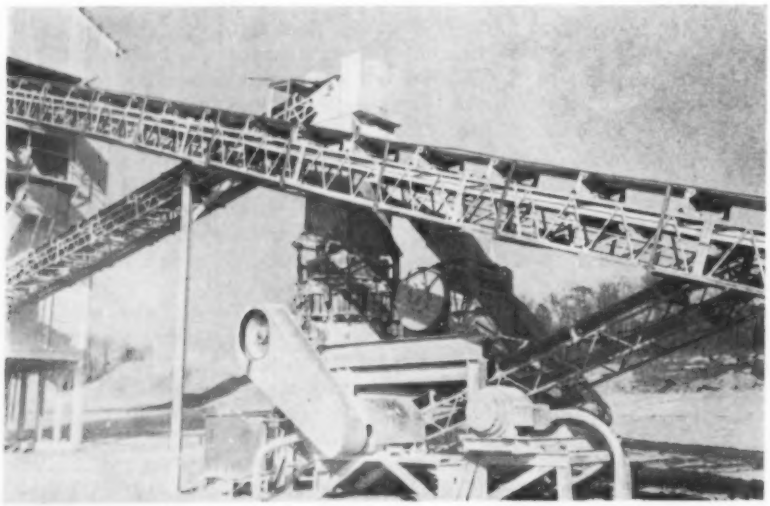
Prior to loading operations on the morning following a blast the quarry floor is meticulously cleaned of stone fragments as a protection for the tires of haulage units and other rolling stock. The broken stone is loaded by a 1½-cu.-yd. Marion 362 diesel shovel to a pair of 18-ton end-dump Euclid trucks. There is a relatively short haul between the quarry shovel and the plant feed hopper, largely on a favorable grade to load.

At the plant site the trucks dump into a hopper over a 36-in. by 14-



A pair of 18-ton end-dump trucks feed the primary jaw crusher. There is only a short haul on favorable grade from shovel to dump hopper.

Material from the secondary crusher (out of view, left), is split through the chutes to the parallel belts leading up to the two finishing screens. The latter are identical units and are fitted with screencloth of the same openings on their corresponding decks.



A closeup of the tertiary crushing phase. These fine reduction units may be fed simultaneously, or one at a time. Discharge is returned to the parallel finishing screen belts.

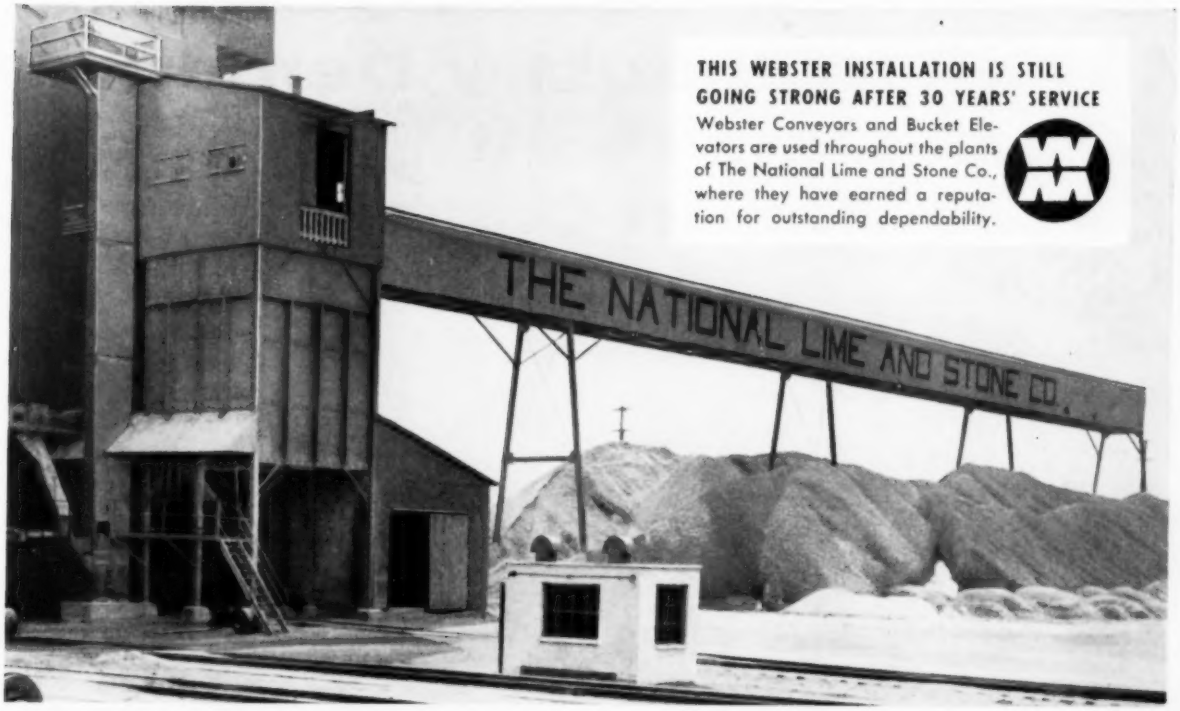
ft. Telsmith apron feeder. On the latter the quarry-run material is transferred to the primary crusher, a 30- by 42-in. Universal jaw driven by a 125-hp. motor. The crusher product is discharged to a 30-in. by 20-ft. conveyor and transferred to the 30-in. by 120-ft. inclined plant feed conveyor.

The latter unit, which was retained from the original plant, was installed in order to get the new plant into operation expeditiously. Due to its width, it is being run faster than its designed speed in order to provide the 250 to 300 t.p.h. feed. However, this conveyor will be replaced by a 36-in. unit in the near future.

From the plant feed belt, the primary crusher product is discharged on a Simplicity 4- by 14-ft. double-deck scalping screen mounted over a pair of 100-ton capacity bins. While screencloth changes are made occasionally, the following will serve as an example of the material flow at this point. The stone retained on the scalper's 3-in. opening top deck is chuted to the secondary crusher. Both fractions retained on the split bottom deck may either go to the crusher or to a conveyor for transfer to the next processing stage. Two other fractions passing the bottom deck are chuted to the underlying bins.

Secondary reduction is done in a Symons 4¼-ft. standard cone crusher, V-belt driven by a 150-hp. motor. Products of this reduction are discharged to a 30-in. by 40-ft. belt conveyor, where they are joined by the materials retained on the scalper's bottom deck. This short conveyor transfers the stone to an inverted V-chute through which the flow is equally divided to a pair of inclined 30-in. by 120-ft. conveyors and carried to the finishing screen tower.

(*Continued on page* 126)



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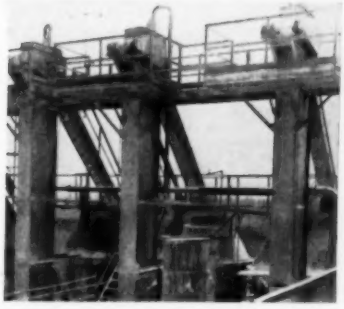
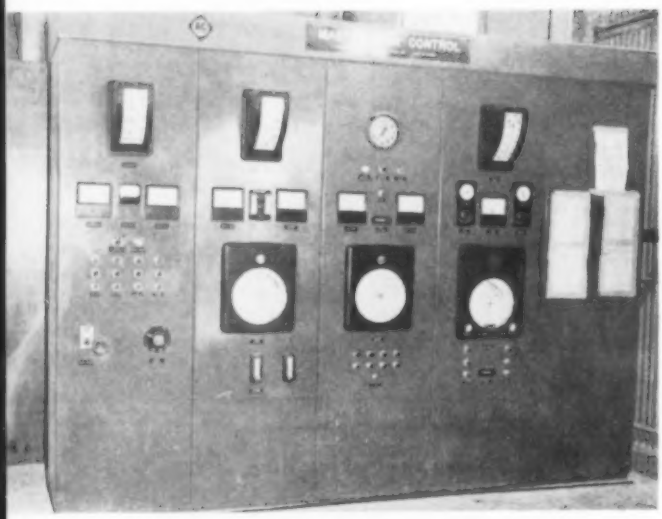


Battery of Webster Bucket Elevators handling fine limestone.

Head end of one of the 24" pitch, 42" wide Webster Super Capacity Elevators handling 10x0 stone from primary crusher.

Uranium Industry Demands Spark Lime Plant Expansion In Canada

By WALTER E. TRAUFFER



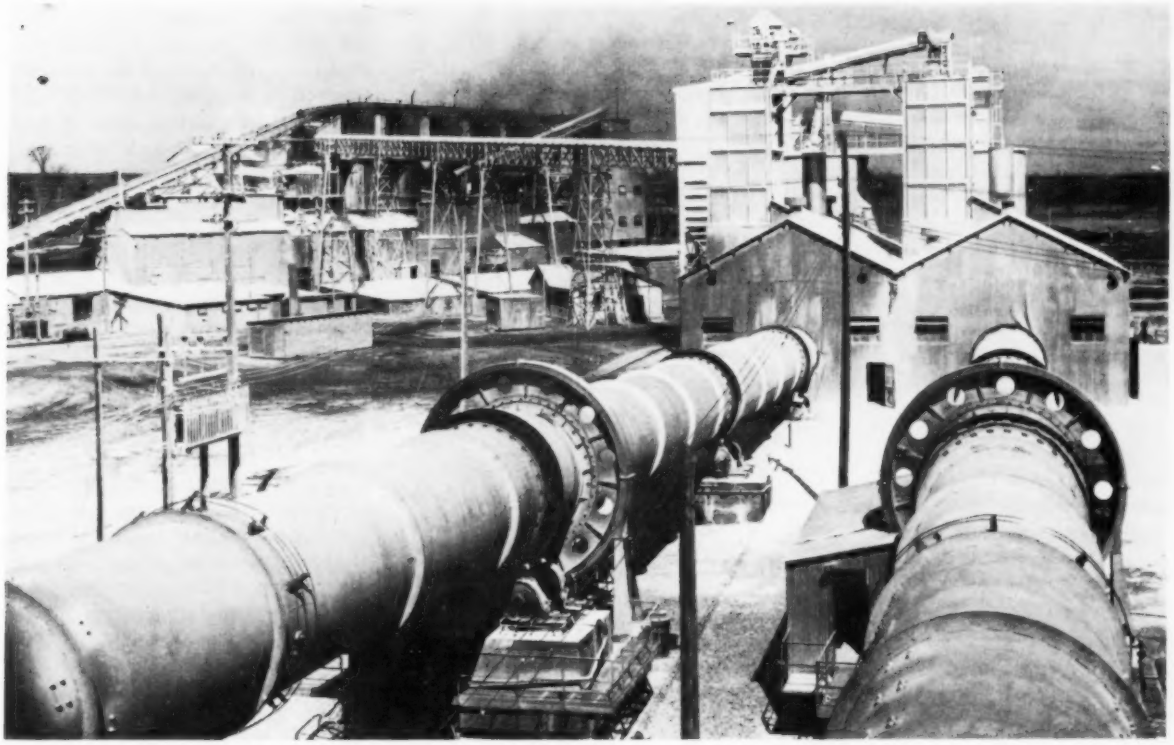
The central control board for the newer (No. 2) of the two rotary kilns. On it are draft and temperature recorders and controllers, speed indicators, ammeters, voltmeters, etc.

This view of the shaft kiln plant shows the newest kiln (No. 6) at the right. At the left is the horizontal conveyor from the rotary kiln plant, and under it is the hydrating building.

ANOTHER ON THE SPOT REPORT

WITH the demand for various types of nonmetallic minerals down substantially in the last few months, there is now considerable excess capacity. Emphasis is therefore being placed on efficiency and economy of operation. This is just as true in the lime industry as in any other. Sharp watch is also being kept for new markets and new uses for lime. The recent interesting experiences of one large lime manufacturer in Canada are described in this article.

Gypsum, Lime & Alabastine, Canada, Ltd., has long been the largest producer of lime in Canada, with three plants in Ontario, two in Quebec, and two in British Columbia. These operations had been gradually expanded over the years as demand increased. Then the uranium boom developed, centered in the Blind River area of Northern Ontario. The potential of this new market was so great that considerable additional capacity was necessary to supply the needed quicklime. The officials of the company studied various alternative



A view from feed end of rotary kilns at the Beachville plant, showing the lime cooling and storage building. The conveyor bridge (background) carries lump lime to the vertical kiln plant for crushing, screening, and hydrating.

methods of expansion, including that of building a new plant on the wild north shore of Georgian Bay, in the Blind River area.

These plans were all finally rejected in favor of expanding capacity at the Beachville, Ont., plant. One of the main reasons for this choice was that, like all vertical kiln lime plants, this operation had an excess of small sizes of limestone. This material was ideal, not only for lime for use in uranium processing, but also for calcining in rotary kilns. In order to get enough additional capacity, it was decided to install a large rotary kiln. Even before this unit was in operation, it became obvious that the uranium demand would require a second rotary, and plans were changed accordingly. In order to insure enough stone for these rotaries, it was decided also to expand the crushing and screening department; and in order to provide the proper balance of fine and coarse stone, it was decided to install a sixth vertical kiln.

The first 9- by 250-ft. rotary kiln went into operation on October 17, 1956, less than a year after engineering plans were started. The crushing and screening department was completed in April, 1957, the second rotary kiln in July, 1957, and the No. 6 shaft kiln on November 11, 1957. Ample space was left for furture additional vertical or rotary kilns.

Each of the two rotary kilns is rated at 240 t.p.d., but is actually averaging about 250 tons. After a reasonable tuning-up period a 300-ton output is expected. These kilns are operating on a fuel ratio of about 3.8 to 1 or 7,400,000 B.t.u. per ton. Four of the vertical kilns are producing 75 t.p.d. each, and the two newer ones each average about 170 tons daily, giving the entire operation a present capacity of about 1,100 tons of quicklime per day.

About 40 percent of production is now going to the uranium industry, and the demand is still growing. In uranium processing quicklime is used for treating process water, for neutralizing acid wastes, and in the precipitation stage of uranium concentrate cake. With this flexible combination of kilns and other equipment, it is also possible to meet any special demands from regular commercial customers.

The four oldest vertical kilns burn 3½- to 6-in. stone and the two newer ones use 1¾- to 3½-in. stone. About half the stone is under 1¾-in. in size. This was formerly sold for various uses when it could have been more economically burned in rotary kilns. Now all except the extreme fines is calcined —in the summer everything from ¼ in. up. In the winter ½-in. minus material is wasted because the inevitable dirt and moisture would make it difficult to calcine and would cause kiln rings to form. The ½-in. minus stone forms 25 percent of the total input, the minus ¼-in. material forms only 17 percent.

Rotary Kilns Except for their feeders, the two rotary kiln installations are identical. From their respective bins the No. 1 kiln is fed 1¼- to 1¾-in. stone by a Syntron-Toledo Gravimetric feeder, while the newer No. 2 kiln is fed ½- to ¾-in. or ¾- to 1¼-in. stone by a Merrick Feedoweight —both discharging through plain feed pipes. Both are 9- by 250-ft. Allis-Chalmers 4-support, all-welded rotary kilns, equipped with air seals at both ends. Each has a slope of ½ in. per ft. and is being driven at the rate of 1 r.p.m. Drive is through a reducer and Texrope V-belts by a 75-hp. Allis-Chalmers 1200/900/600/450-r.p.m., 4-speed, 3-phase, 60-cycle, 440-v., totally-enclosed, fan cooled, high-torque, squirrel-cage induction motor. On both kilns the 900-r.p.m. speed is ordinarily used. Each kiln has an auxiliary drive consisting of an Allis-Chalmers gasoline engine connected through a reducer and clutch to the high-speed shaft of the main reducer. On kiln No. 2 only there is a synchronous tie between the drive motor and the kiln feeder motor.

Beginning at the back end, the kilns are lined with 100-ft. of Duro abrasion-resistant 6-in. brick, 50 ft. of high-heat-duty brick, 90 ft. of 70 percent alumina brick, and 10 ft. of Dean super-duty brick—all Harbison-Walker. Also at the feed end there is a 40-ft. section of steel heat exchanger quadrants starting 50 ft. from the end. The quadrants are in 5-ft. sections and consist of 1½-in. thick L-shaped sections bolted to metal legs which in turn are bolted to the kiln shell. The first section from the feed-end is made of stainless steel for wear resistance; the others are cast steel.

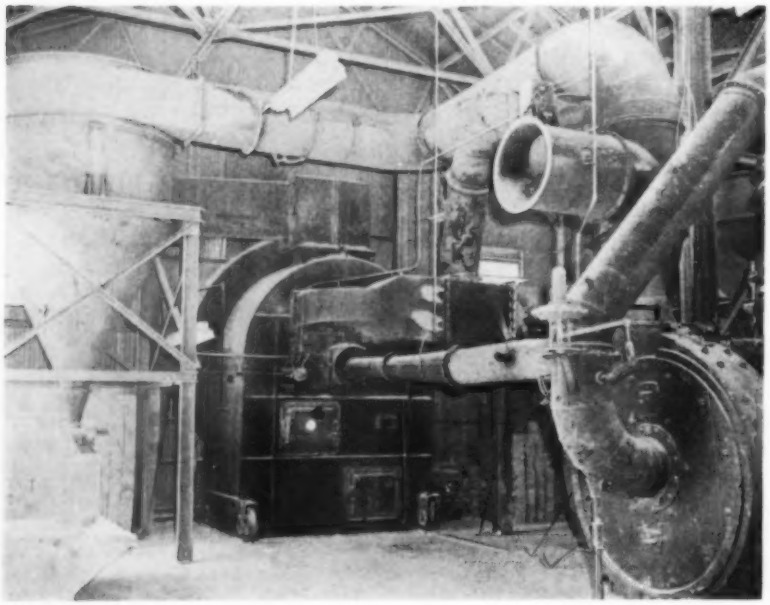
Coolers The calcined lime from each kiln is discharged into a 3- by 50-ft. Allis-Chalmers air-quenching, shaking-grate cooler. This is driven through V-belts by a 7½-hp. d.c. motor. Cooling air is provided by a 30-hp., 33,000-c.f.m. fan, and most of this air is later released to atmosphere through an evase stack. A Multiclone dust collector, rated at 23,000 c.f.m., removes dust from the secondary air going to the kiln. This unit is followed by a 26,300 c.f.m. induced draft fan.

Coal As freight forms the largest part of the cost of coal at this location, it is considered economical to use the best grade available. This is 2-in. minus West Virginia bituminous coal with 6 percent ash and 0.8 percent sulphur. The coal is hauled by truck from a lake port to a hopper, which is also equipped for railroad cars. A pan conveyor feeds the coal to a Jeffrey roll crusher, which reduces to ¼-in. minus size. A bucket elevator feeds direct to one of two 80-ton bins for the No. 1 kiln or to a belt conveyor for the No. 2 bin.

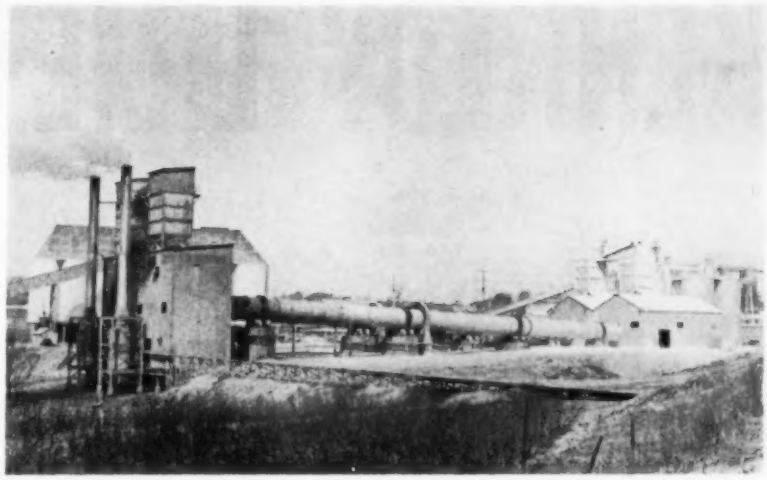
For each kiln a chute supplies the coal to the feeder of a No. 462 Raymond direct-firing bowl mill, which grinds to a fineness of 83 percent through 200-mesh, using drying air from the kiln hood tempered by dampers to 180 deg. F. This mill is complete with the usual classifier, exhauster fan, etc. The dried pulverized coal is drawn through an exhauster fan to the kiln burner pipe. This is an air-cooled pipe with annular sections 48 in. and 9 in. in dia. Entering the kiln hood at the center, it extends 6 ft. into the end of the kiln, sloping slightly downward and to the right (toward the bed), with its end 3 in. below and 2 in. to the right of center. A medium-length flame is used.

Kiln Gases The kiln gases are drawn through breeching and Western Precipitation 75,000 c.f.m. cyclone collectors to the two 125-hp., 75,000 c.f.m. Canadian Sirocco main draft fans. A remote-controlled louvre damper controls the temperature going into each fan. The gases then go to a pair of 9-ft. dia. Peabody vertical water spray towers or scrubbers. These are equipped with two decks of very fine sprays, but only one of these is now being used. The gases are exhausted to atmosphere through 4-ft. dia. by 60-ft. steel stacks above the scrubbers. The sludge from the scrubbers goes to settling basins and is wasted.

Kiln Control The present method of kiln operation is to allow enough induction (½ to 1 in.) of secondary air from the cooler to keep a puff. The kiln is kept on No. 3 speed—900 r.p.m. of the motor and 1 r.p.m. of the kiln. The kiln operator, under the general direction of the supervisor and the chemist, adjusts all other controls. This means keeping a 2,400 to 2,600 deg. F. temperature



At the hood end of the new No. 2 rotary kiln are the radiation pyrometer, the coal mill, the fan, and (left), the cyclone through which drying air for the coal mill is drawn from the kiln hood.



Another view of the rotary kiln plant, showing the two vertical spray gas scrubbers with the stacks above them. Behind the kiln feed building are the stone storage silos for both plants.

on the Rayotube optical pyrometer, which is aimed 6 ft. in from the end of the brick work. The primary air temperature from the coal mill is about 190 deg. F., and the secondary air from the cooler about 700 deg. F. The gases leave the kiln at about 850 deg. F., entering the kiln draft fan. Draft is about 0.04 in. at the discharge end of the kiln and 3 in. ahead of the fan.

The Canadian Allis-Chalmers master control board for the kiln and related equipment is simple and compact yet complete. On the panel are the following:

Kiln draft indicators and recorder and control for kiln hood pressure;

Cooler and coal mill draft indicators

2-pen kiln temperature recorders

2-pen coal mill temperature recorder

Hood radiation pyrometer and exit gas potentiometer with warnlight and alarm horn

3-unit sight draft gage for combustion control

Recorder and two controls for bleed in air dampers ahead of the kiln and cooler dust collectors

Coolers speed indicator

Kiln revolution counter

Ammeters, voltmeters, pushbuttons, etc.

Kiln Rings There has been some rather interesting experience with ring formation in these kilns. In both, small stone (½- to ¾-in.) was burned when starting up with new lining, in order to get a good initial coating. With the No. 1 kiln, which has been calcining 1¼- to 1¾-in. stone at all times except after relining, there has been very little ring trouble. In February, 1958, six months after this kiln was last repaired, it was necessary to reline 28 ft. in the firing zone. Three weeks later, when this plant was visited, there was no appreciable sign of ring formation. This is attributed to the improved method of operation now being used.

Formerly a ring would form in the No. 1 kiln about 30 ft. from the firing end. When it had built up badly, it would be shot out with a kiln gun. From 3,000 to 4,000 shots were required. Later it was found that at about 1 ft. thickness, this ring, acting as a dam, actually improved operation, holding the material a little longer in the calcining zone. The extra soaking reduced the amount of core considerably without the danger of overburning which would result from more direct exposure to the flame. A product which averages 94 percent available lime can be made in normal operation.

The desired 1-ft. ring was maintained as closely as possible. At intervals of about two weeks it was necessary to cut it down to the desired level. This usually required from 200 to 300 shells. The kiln gun is a Remington using 8-gauge lead shells.

The new No. 2 kiln, which has been calcining ½- to ¾- and ¾- to 1¼-in. stone, had no appreciable ring formation for three months after it was started up in July, 1957. Then considerable wet and cold weather caused some stopping and starting of the kiln, and frozen coal also gave trouble. As a result, a short, thin ring formed then, but it has not grown appreciably since.

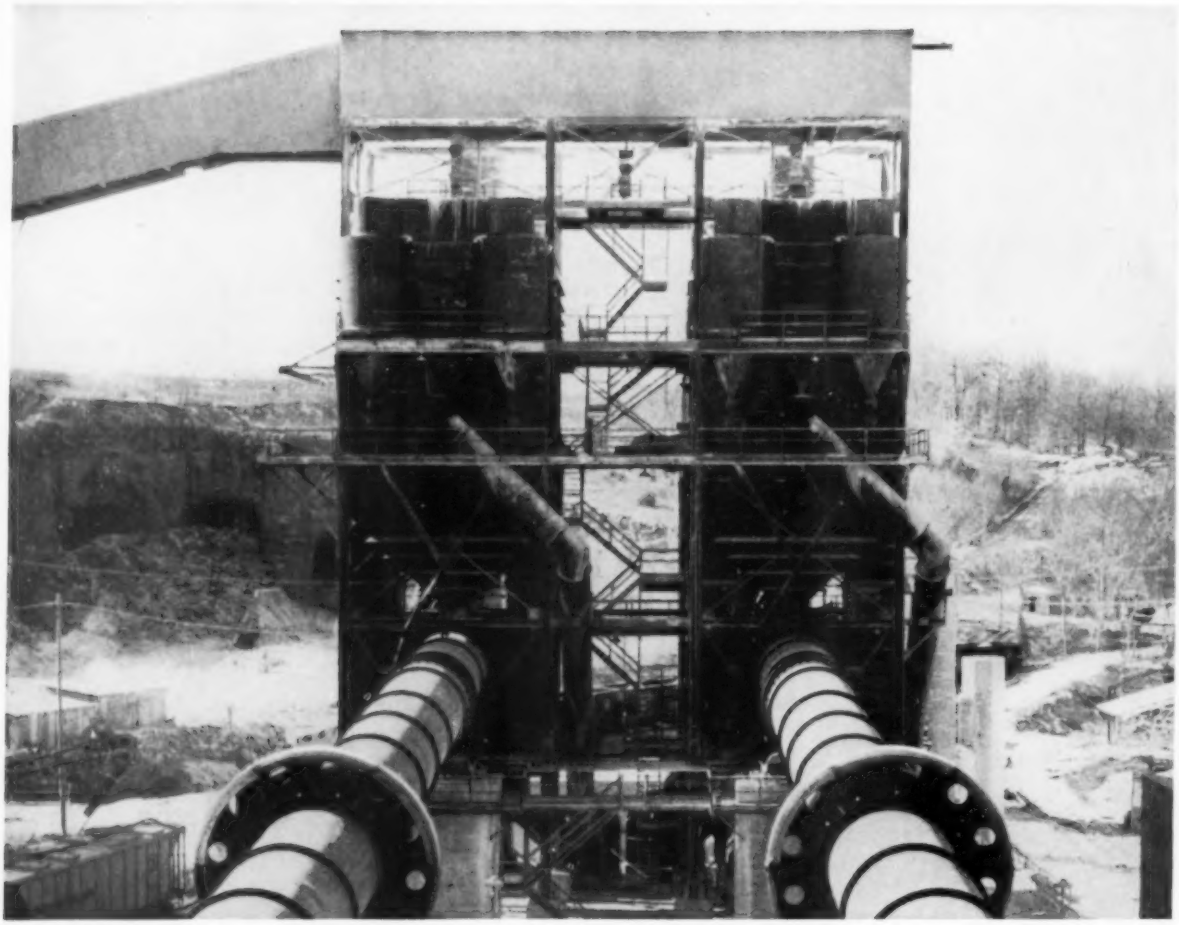
Lime Handling From the coolers, the calcined lime is discharged on 18-in. by 35-ft. pan conveyors. These incline to discharge to bucket elevators, which feed into four 250-ton reinforced-concrete storage silos. An arrangement of conveyors also makes it possible to feed from either elevator direct to a 100-ton silo for railroad car loading. From either or both silos a very flexible system of conveyors and elevators can also feed direct to the loading bin, or to a 6- by 14-ft. Tyler F300, single-deck screen for removal of minus ½-in. material before it goes to the loading bin.

Another option is for coarser material to go to a hammermill and then either direct or *via* the screen to the loading bin. With this system, any desired sizes of quicklime, from 1¾-in. down to 0, or with the fines removed, can be made to customer's specifications.

Provision is also made for feeding any desired size of quicklime to the older shaft-kiln plant for crushing, screening, hydrating, and/or loading. This transfer of material is done on a 24-in. by 400-ft. belt conveyor which is carried nearly horizontally on 40-ft. high structural steel bents.

Hydration The original hydrating department at this plant was totally destroyed by fire late in 1951. While quicklime was temporarily hydrated at another of the company's plants, a new and modern new department was built[1], going into operation late in 1952. This plant uses the Knibbs system, with a 10-ton continuous hydrator preceded by a premixer

KENNEDY LIME PLANTS



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- top quality product

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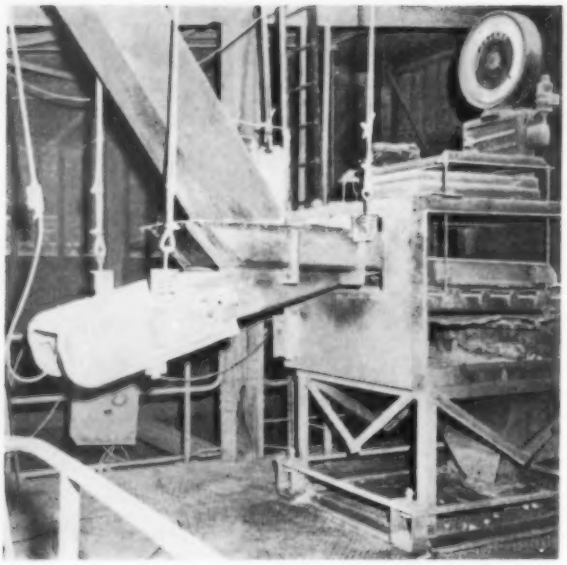

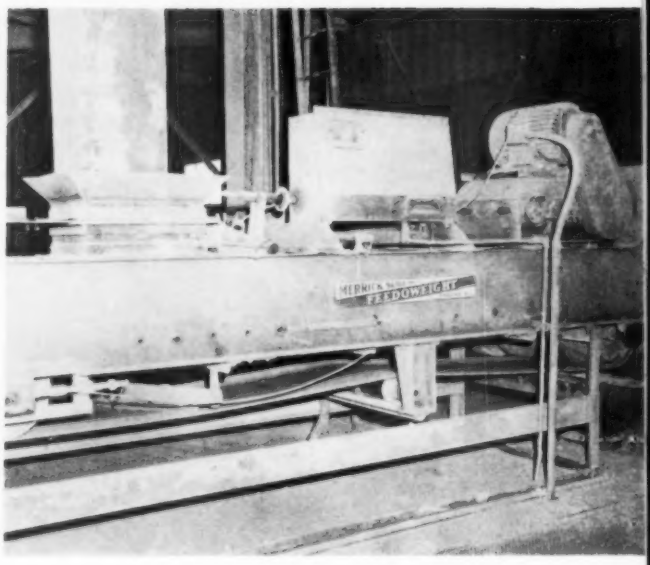

in which hydrating starts. There are separate packers for quicklime and hydrate. No major changes have been made in this department since it was built.

Above, left: The vibrating-type feeder for the No. 1 rotary kiln.

Above, right: The belt-type weighing feeder on the No. 2 rotary.

Right: At the discharge end of one of the two shaking-grate lime coolers is the grizzly, which removes any large lumps from plant flow.

Plant History The Beachville plant has had an interesting history since it was built in 1901. Beginning as a small shaft kiln operation, it was expanded and improved gradually through the years. The old direct-fired shaft kilns were replaced some years ago by the more efficient producer-gas-fired kilns now in use. The fifth of these kilns was installed early in 1950[2]. This type of kiln is a European development first introduced to this country and improved by J. H. Robinson, who was then general superintendent of the company. In 1950 they had an average production of 72 tons of lime per kiln per day, with a fuel ratio of over 5 tons of coal, or about 5.5 million B.t.u.s per ton of lime. This compared with a capacity of 18 tons of lime and a fuel ratio of 3.5 to 1 (about 8 million B.t.u. per ton of lime) for the same kilns when they were direct-fired.

These kilns all had a central flue type of burner, with small gas ports regularly spaced along its length on both sides. There was induced draft through a duct near the top of the kiln. They were and still are fired by two 10-ft. automatic gas producers—a Woods and a Wellman. Since then, kilns 1, 2, and 3 have been redesigned. Each has a 6- by 10-ft. cross-section and is 62-ft. high from the base of the shell. Drawing is done at 30- to 35-minute intervals manually. They are being fed 3½- to 6-in. stone and average 75 tons of lime per day. The No. 4 kiln was built later and has only minor differences in design. It is fed the same size of stone and has the same capacity.

The No. 5 kiln, which was added in 1950, and the No. 6 kiln, added in 1957, are basically similar in design to the other four, but are 72 sq. ft. in cross section. They are fed 1¾- to 3½-in. stone and are producing 170 t.p.d. each, with a fuel ratio of 6 to 1 (4,000,000 B.t.u. per ton). This higher efficiency and capacity is credited to the fact that these kilns have double center flues, greater induced draft,

[1] See PIT AND QUARRY, December, 1950, pp. 78-82—*Recent Developments in Vertical Shaft Lime Kilns*, by M. F. Parsons.

[2] See PIT AND QUARRY, May, 1953, pp. 103-5, 116—*Design and Operation of a New High-Calcium Lime Hydrating Plant*, by R. S. Adams.

better location of draft fans, and other differences—all the result of exhaustive experimentation. The No. 6 kiln is fired by a 10-ft. Wellman Galusha gas producer which has enough capacity for another similar kiln if it is necessary to install one later. All the kilns have induced 1-draft hoods, and the CO_2 gas is used in the gas producers.

Further changes are planned for kilns 5 and 6, and with closer supervision they are expected to attain capacities of over 200 tons each.

Quarrying and Sizing The limestone deposit is in the Detroit River formation and is of high purity, with a $CaCO_3$ content of about 98 percent. This is the upper level in the quarry. The 20-ft. second level is in the Bertie Akron formation and has a slightly higher MgO content. The stone is loaded by two 2½-cu. yd. Northwest diesel shovels into 12-ton Easton side-dump bodies on Mack diesel truck chassis. These haul to the new primary crusher station, which is at the level of the main bench.

The 30-in. Allis-Chalmers Superior McCully gyratory primary crusher reduces to 10 in. and under. A series of 36-in. belt conveyors take the stone to a Nordberg vibrating grizzly having variable spacing between the bars to control sizing. The oversize feeds to a 4¼-ft. Nordberg Symons standard cone crusher. The 1¾-in. minus product and the grizzly throughs are taken on a series of 36-in. belt conveyors to a surge stockpile with a live storage capacity of 700 tons.

A Syntron vibrating feeder reclaims from storage on a 36-in. belt conveyor to a 6- by 14-ft. Simplicity 2-deck screen. This always has 3¼- and 1¾-in. openings. The 3½-in. plus oversize goes to one (No. 7) of six reinforced-concrete storage silos and is feed for shaft kilns No. 1 to 4. The 1¾- to 3½-in. stone off the bottom deck of the screen goes to a second 1,000-ton silo (No. 6) and is feed for shaft kilns No. 5 and 6.

The minus 1¾-in stone through the bottom deck of this screen is carried on a belt conveyor to a 6- by 14-ft. Tyler F800 Tyrock screen with 1¼- and ¾-in. openings. The 1¼- to 1¾-in. oversize from this screen goes by gravity into 1,000-ton silo No. 5. This material is usually feed for the No. 1 rotary kiln but it can be used in either. The ¾- to 1¼-in. rock off the second deck goes by gravity into 1,000-ton silo No. 4. This is feed for either of the rotary kilns.

The minus ¾-in. material through the bottom deck of the second screen is carried on a belt conveyor to a third screen—a 6- by 14-ft. Simplicity 2-deck unit with ½- and ¼-in. openings. Its oversize goes by gravity to 750-ton silo No. 3 as feed for either rotary kiln.

The ¼- to ½-in. material off the bottom deck of this screen goes by gravity into 750-ton silo No. 2 as feed for the No. 2 rotary kiln. The minus ¼-in throughs from this screen are conveyed to a stockpile and are sold for cement manufacture.

The stone for the vertical kilns is drawn from silos No. 6 and 7 into a 5-ton mine car, which is hoisted up an incline to the top of the kilns and dumped into the desired kiln. The kiln hoods are opened, the cars are spotted and dumped, and the hoods are closed automatically.

Rotary Kiln Feed The rotary kiln stone sizes stored in silos 2, 3, and 4 are reclaimed by Syntron feeders onto the first of a series of belt conveyors, and an elevator feeds to a 6- by 14-ft. Simplicity single-deck screen. The stone from the No. 5 silo is fed by a separate belt conveyor to the same elevator. This screen usually has ⅜-in openings to remove any fines but it can be varied with the weather and the size of stone being processed. A 20-in. by 424-ft. belt conveyor, which is nearly horizontal and is supported on 6-ft. high steel bents, carries the stone to the two 80-ton rotary kiln plant feed bins. The stone is discharged direct into the bin for kiln No. 1 and on a short belt conveyor to the No. 2 kiln bin.

Personnel J. H. Robinson, executive vice-president of Gypsum, Lime & Albastine, Canada, Ltd., is in general charge of the company's operations. W. T. Unsworth is plant manager; J. H. Robinson Jr., is assistant plant manager, and John Sharpe is chemist.

Editorial Protests Reopening Of Limestone Plant by State

An editorial appearing recently in the Richmond *News Leader* under the heading "Another Surrender at Appomattox" protested the reopening of a lime plant operated by the State of Virginia at Appomattox. The editorial deplored this "silent surrender to socialism" and disapproved of the state's open competition with private producers capable of supplying all the lime needed by the state.

It was pointed out that Virginia's three lime grinding operations have already cost the state $40,000 over the last six years, with the loss at Appomattox totaling more than $18,000.

New Scow Shifter Designed By N. Y. Trap Rock Engineers

A new scow shifter was devised by the engineers of the New York Trap Rock Company, New York, N. Y., when it was discovered that a scow mover to fill the company's needs was not available on the market.

Now being assembled under the supervision of Melvin C. Dow, chief engineer, components making up the scow mover include, motor, hydraulic drives, speed reducer, cable drum, air-operated clutches and brakes, and remote controls. The new system will replace the firm's two-drum standard hoist, which utilizes mechanically operated controls.

A record-breaking year was reported by Pacific Clay Products, Los Angeles, Calif., with a net income of $1,301,739 or $2.52 a share and sales of $8,822,686. Comparable 1956 figures were $1,161,331 or $2.25 for income and $8,117,707 for sales.

The Arundel Corporation, Baltimore, Md., has purchased 250 acres adjoining its stone quarries near Havre de Grace, Md., from Albert and Frank Silver for a reported price of $250,000. The new tract will supplement dwindling resources at the present quarry on the Susquehanna River.

Unusual Features Patented In Rotary Kiln Design

PATENT No. 2,624,562, issued to Theron C. Tayler, is one of a series of developments designed to jointly increase production of lime or cement several fold while simultaneously providing substantial gains in efficiency, improved quality, and a reduction in production cost for either product. The patent represents some radical departures from contemporary practice—not the least of which is a tripling of the length of the calcining zone.

It has been generally recognized and established that the capacity and thermal efficiency of a short rotary kiln can be materially increased through the use of an external stone or slurry preheater such as in the Kennedy-Van Saun, Lepol, Uhle-Grunewald, and others. Gains for high-calcium lime are greatest when the kiln is used exclusively for calcination, with gases exhausted at 1,500 to 1,600 deg. F. and the stone entering from a separate preheater at 1,450 to 1,-550 deg. F.

A primary obstacle to getting such results from a long kiln has been the limitation of flame length. To achieve that goal, it is necessary to get a long flame of fairly uniform intensity. This is comprehended in the patent with a burner consisting of multiple concentric jets of different velocities, combined with the recirculation—at a minimum loss in temperature—of a portion of inert gases from the dust chamber, plus an unusually high preheat (900 to 1,100 deg. F.) of combustion air and fuel.

Theron C. Tayler

The burner is entirely outside the kiln proper. Fuel, hot air, and hot inert gases enter the kiln at the firing hood in three or more concentric jets (depending on the kiln length). The center jet stream is of such a mixture and high velocity as to provide burning at its maximum temperature from 100 to 250 ft. beyond the firing hood—again relative to the length of kiln. The comparatively low velocity stream from the outer jet consists essentially of what is generally termed secondary air. The jet next inside the outer one has basically the same composition as the center jet, and a velocity such as to produce the maximum flame temperature at a distance varying from 12 to 16 ft. beyond the hood.

In normal operation, preheated stone or slurry is fed to the kiln at an absolutely constant weight per kiln revolution. Kiln speed is also maintained absolutely constant, and much higher—double or more—than usual kiln speeds. Preheat temperatures of stone or slurry, combustion air, and fuel remain practically constant. A thermal element, located in the dust chamber so that the temperature at this point does not vary more than plus or minus 5 deg. F., automatically controls fuel and combustion air quantities within a range of plus or minus 5 percent.

To dispense with all manual controls—except for starting up a cold kiln—it is most important that the *control of the degree of burning be stable*. This rules out application of conventional control methods. In the design discussed here, a radiation pyrometer is focused on the finished product at a point about 14 ft. from the firing hood. This pyrometer alters only within a range of plus or minus 5 per cent the quantity of hot inert gases entering that jet which produces its maxi-

(*Continued on page* 140)

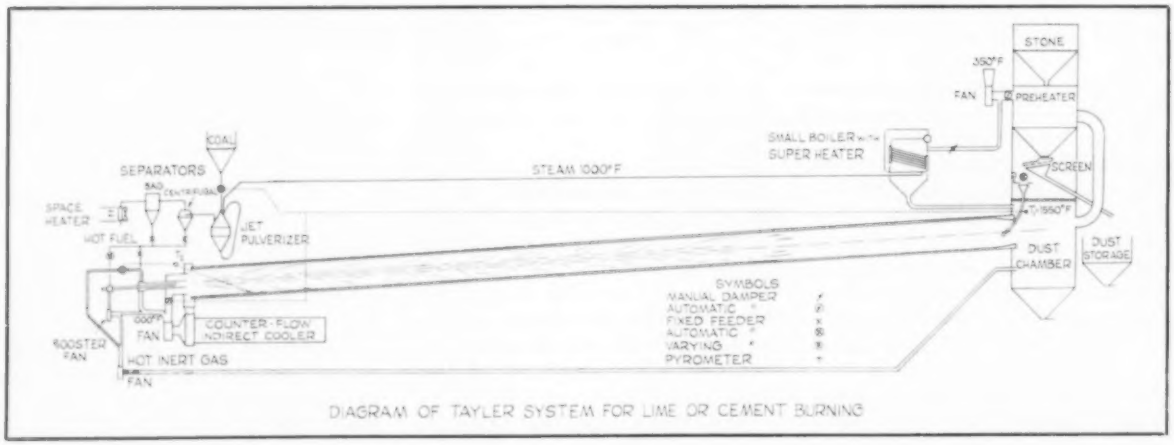

DIAGRAM OF TAYLER SYSTEM FOR LIME OR CEMENT BURNING

Enter 121 on card, page 239 →

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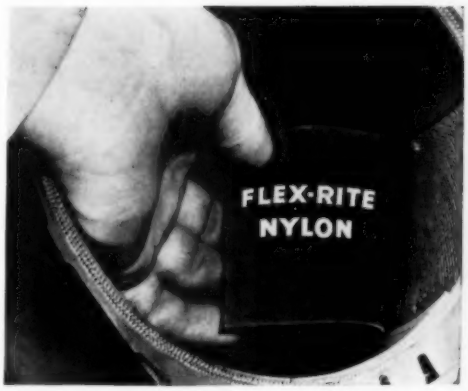

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ROCK SERVICE for heavy-duty mine, quarry and dirt-moving work. Tubeless or tube-type. 18.00-24 through 33.5-33.

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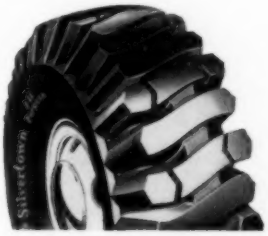

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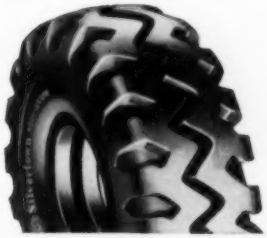

ROCK LOGGER for front or drive wheels in logging and similar heavy-duty work. Tubeless or tube-type. 8.25-20-14.00-24.

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Lift the page for complete information on money-saving B.F.Goodrich on-the-job tire service!

Turn the page and see how 6 contractors saved with B.F.Goodrich tires and tire service!

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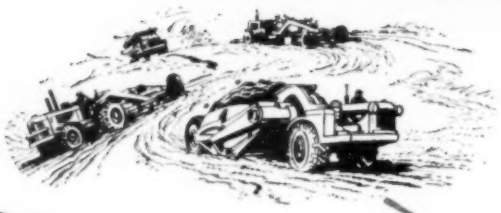
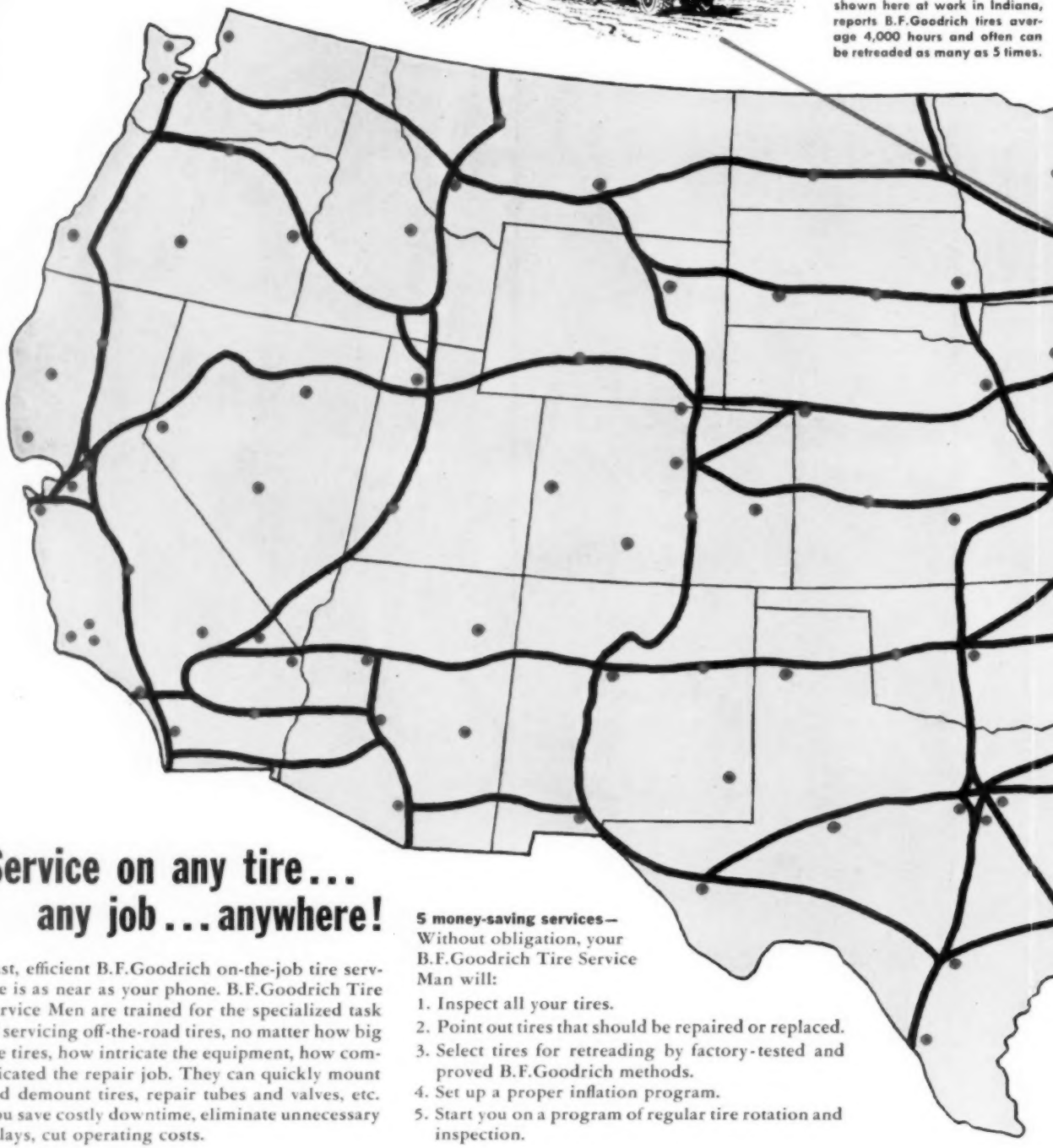
Wherever you go B.F.Goodrich tire



S. J. GROVES & SONS CO., shown here at work in Indiana, reports B.F.Goodrich tires average 4,000 hours and often can be retreaded as many as 5 times.



Service on any tire... any job... anywhere!

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5 money-saving services—
Without obligation, your B.F.Goodrich Tire Service Man will:

1. Inspect all your tires.
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B.F.Goodrich *off-the-road tires*

e service keeps you on the go!

The red dots represent B.F.Goodrich dealers who offer on-the-job tire service. Whether you're at work on the $50-billion, 41,000-mile Interstate Highway System (black lines), or on any other construction, mine or quarry project, you can be sure of expert, efficient tire service on the job from your local B.F.Goodrich dealer.

CO.,
diana,
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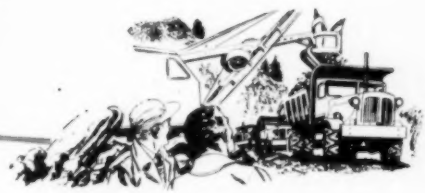
O'CONNOR CONSTRUCTION CO. is turning an old road into a 4-lane highway in central Illinois, reports B.F.Goodrich tires give 6,000 hours of service, including retreads.



JERNIGAN TRUCKING CO. equipment hauls stone for bridge approaches near Augusta, Ga. The company reports B. F. Goodrich FLEX-RITE NYLON tires have gone over 50,000 miles—an all-time record on this operation.

FULLY EQUIPPED SERVICEMOBILES—B.F.Goodrich Servicemobiles are equipped with hydraulic crane, pneumatic wrenches, bead jacks and all of the latest power tools and devices for speedy, efficient tire service on the job.

How 6 contractors save with B.F.Goodrich tires

IN ILLINOIS—CKG Associates is at work on the Northern Illinois Toll Road near Elgin. The company operates 115 vehicles, uses B.F.Goodrich FLEX-RITE NYLON Rock Service, Tractor Grader, Earth Mover Traction, Rock Logger and All-Purpose tires. Excellent on-the-job service is one reason they prefer B.F.Goodrich tires.

IN WASHINGTON—"We switched to B.F.Goodrich FLEX-RITE NYLON Rock Logger tires 3 years ago," writes Richard M. Ward, Truck Supt. of F. R. Hewett Co., contractors of Spokane, Wash. "They have given us up to 50% more service than the tires we used previously. We have been able to retread them too."

IN NORTH DAKOTA—This scraper is one of 75 units operated by Northern Improvement Co. on road projects in the Dakotas, Minnesota and Montana. The scraper weighs 35 tons loaded, works 60 to 72 hours a week. The B.F.Goodrich FLEX-RITE NYLON Super Traction tires give 5,000 hours' service before retreading!

IN FLORIDA—The Ralph E. Mills Company builds roads all over the world. Here the job is grading and filling on the Florida State Turnpike. The company reports B.F.Goodrich FLEX-RITE NYLON Super Traction tires work as many as 3,000 hours, thanks in part to the on-the-job service the local BFG dealer gives.

IN MICHIGAN—Julius Porath & Son Co. builds roads in southeastern Michigan, uses 105 pieces of equipment including trucks, cranes, dozers and graders. Because much work is in sand, Porath uses B.F.Goodrich FLEX-RITE NYLON 65" Special Earth Mover tires, reports they are "the best tires for this type of work."

IN PENNSYLVANIA—Gasparini Excavating Co., Inc., does highway and heavy construction work—here on the Pennsylvania Turnpike. The company finds "B.F.Goodrich FLEX-RITE NYLON tires give over 4 years' service. They minimize breakdowns and impact breaks, give maximum contract performance in the shortest contract period."

B.F.Goodrich Smileage!

Appointments and Promotions

R. MARTIN BRUNS has been appointed assistant manager of industrial relations of the Louisville Cement Company, Louisville, Ky. He was formerly a training specialist with the Mercury Division of the Ford Motor Company.

ROGER L. FOSDICK, formerly assistant to the president of Riverside Cement Company, Los Angeles, Calif., was promoted to the post of assistant to the president of American Cement Corporation, Philadelphia, Pa. (Riverside is now a subsidiary of American.)

JAMES V. ANDERSON JR. has been appointed Virginia district sales manager of United States Gypsum Company, with headquarters in Richmond. Mr. Anderson, with U.S.G. since 1952, was formerly in the Washington (D. C.) office.

JOHN AQUIRRE, A. I. A., has been appointed architect in the Los Angeles office of the Portland Cement Association. Prior to joining P.C.A., Mr. Aguirre was a senior architect at North American Aviation.

ALBERT L. HOWE has been appointed superintendent of the Milwaukee (Wis.) plant of Marquette Cement Manufacturing Company, Chicago, Ill. He was formerly general foreman at Marquette's Rockmart, Ga., plant.

W. N. LAWSON has been elected treasurer and assistant secretary and WORTH LOOMIS was named secretary of the Medusa Portland Cement Company, Cleveland Heights, Ohio.

JOHN D. CASSIDY has been appointed plant engineer of Kaiser Gypsum's plant in St. Helens, Ore. He was formerly plant engineer with U. S. Gypsum Company.

Weight concentration in the lower center section eliminates top heaviness. Combined with 6 part block and tackle reeving, it gives OWEN Buckets that extra power to dig in at the beginning—and to continue to dig with equal force on both jaws during the entire closing cycle. At the end of the stroke, there is no power loss and lifting tendency is at a minimum.

Other features that make OWEN the leading clam-shell "seller" are:

One-piece Head Construction

Riveted Bowl Construction

Single Main Shaft

Recessed Lip Design

On this our 50th Anniversary Year, The Owen Bucket Company wishes to express our appreciation for the excellent acceptance of our products and pledges to maintain in the years ahead the high quality of design, workmanship and service that has become associated with OWEN Products.

The OWEN BUCKET Co.
BREAKWATER AVENUE, CLEVELAND 2, OHIO
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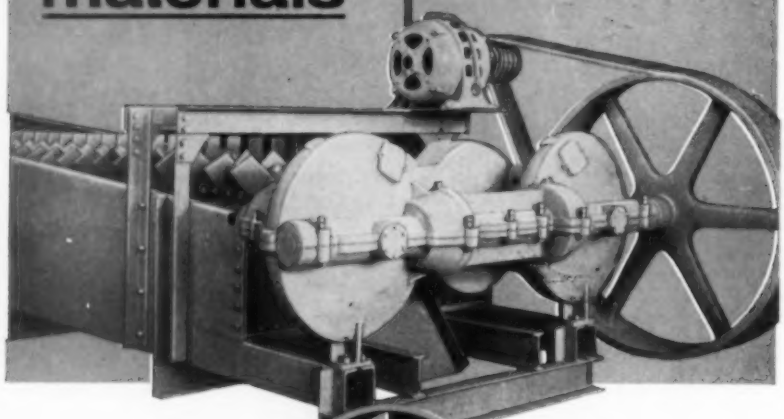
High Capacities of clean materials

Developed from the world's first all-steel log washers built by McLanahan & Stone in 1894, these machines produce high tonnages of exceptionally clean materials—removing tough clay, soft rock and refuse with unequalled speed and economy. Available in Heavy-Duty and Mudmaster styles. *Write for Bulletins WLO-1155 and MM-755.*



McLANAHAN SINCE 1835

LOG WASHERS

McLANAHAN & STONE CORPORATION
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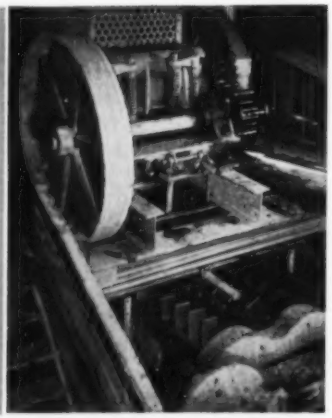
Three 30' McLanahan Logs in world's largest phosphate plant.

McLanahan Logs washing iron ore received from McLanahan Rockmaster Crusher.

Three 35' Logs cleaning 400 to 500 tons of sand and gravel per hour.



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Gary Brothers

(*From page* 110)

The latter houses two identical 4- by 14-ft. Simplicity triple-deck screens that are mounted over a series of eight truck loading bins. These have a total storage capacity of 400 tons. The corresponding decks on the two screens are fitted with screencloth having the same openings, *i.e.*, 1-in. for the top decks, ¾-in. on the middle decks, and split bottom decks with ⅛- and ¼-in. openings.

All fractions retained on and passing the bottom decks of both screens are dropped to the respective section of the underlying bins. Plus ¾-in. material retained on the middle decks may also be chuted to the bins or pass through a flop gate to join the material retained on the top decks. The latter are fed to a 24-in. by 60-ft. conveyor for transport to the tertiary crushers.

Two fine reduction units were installed for tertiary crushing—a 3-ft. Symons short head cone and a Cedarapids 30X33 hammermill. They are V-belt driven by 100- and 200-hp. motors, respectively, and are set at a point between the two parallel conveyors that feed the finishing screens. They may be fed individually or simultaneously, from the 60-ft. conveyor noted above, in accordance with varying quantities of smaller fractions desired.

Both crushers discharge to a 24-in. by 45-ft. inclined belt on which the product is transferred to the inverted V-chute for split to the finishing screen feed conveyors. This closes the final fine reduction circuit.

For further fractionation of the fine materials, a bucket elevator, an air-separator and finish product bins were recently installed adjacent to the final screening tower bins. Any fine fraction, or desired blend, can be chuted from the bins below the screens to the boot of the bucket elevator in which they are raised to discharge into a 12-ft. Sturtevant separator. Products of this dry classification consist of stone sand and 200-mesh material. The former is marketed as agstone and increasingly to concrete masonry plants. The finer product is sold to agricultural feed mills, as rock dust for mines, etc.

With the exception of the lime-

stone powder, all products stored in the various bins below the scalper, finishing screens, and separator, may be trucked to stockpile or to the jobsite. All haulage is done under contract with deliveries weighed out over a 20-ton Fairbanks-Morse scale.

A total of approximately 700 connected hp. is provided in the plant, and is supplied with 220 volts from the new central electrical and control house. Utility service is delivered to the buss bars of this control point at 13,000 volts.

Operations of this interesting facility are handled by a 9-man crew under the direction of Elmond Gary. The Sugar Grove operation, a 125-t.p.h. plant which was constructed in 1950, is supervised by his brother Hayward.

The new Bowling Green plant and growing business enjoyed by the Gary brothers represent the fruits of considerable effort expended in attaining their present status. When the company was formed, in 1947, the first quarrying operation was started in an area on the west side of the city. Within five years, the rapid growth of industrial construction had virtually engulfed the property, and the brothers were faced with the choice of relocating at another site or of potential involvement in litigation over such quarry operations as blasting. In the interests of good will and public relations, the former alternative was followed, and the present tract, north of the city, was obtained in 1952. Here the second plant was built and operated until 1956, when the growing markets—with respect to which the site is advantageously located—led to the decision to construct the more efficient and productive new facility.

The Quincy Sand Company, Quincy, Ill., has purchased a steel-hull dredge to replace one having a wooden hull. The dredge is 60 ft. long with a 20-ft. beam and 4-ft. draft.

Calaveras Cement Company, San Francisco, Calif., reported sales of $12,674,275 and net earnings of $1,501,598, equal to $3.50 a share for 1957. In 1956 sales were $12,085,811; profits, $1,781,604 or $4.15 a share.

Drier, Cleaner Finished Product
. . . HEAVIER CONSTRUCTION
Heavier constructed throughout, these units are designed to exceed the service life of competitive washers, while assuring low-cost removal of waste and water. Among significant design features are: (1) grease-lubricated, anti-friction bearings, sealed against water and sand, (2) simplified drive, (3) sufficient rigidity to be set anywhere without supports under center of box. Write for Bulletin SW-953.
SINCE 1835
McLANAHAN
SCREW WASHERS
McLANAHAN & STONE CORPORATION
258 Wall Street, Hollidaysburg, Pennsylvania
McLanahan Single Screw Washer.
(Far left) Single Screw Washer dewatering concrete sand.
Cleaning and classifying coarse and fine sands with McLanahan Screw Washers.
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Lime Produced, Recovered In City of Dayton's New Calcining Plant

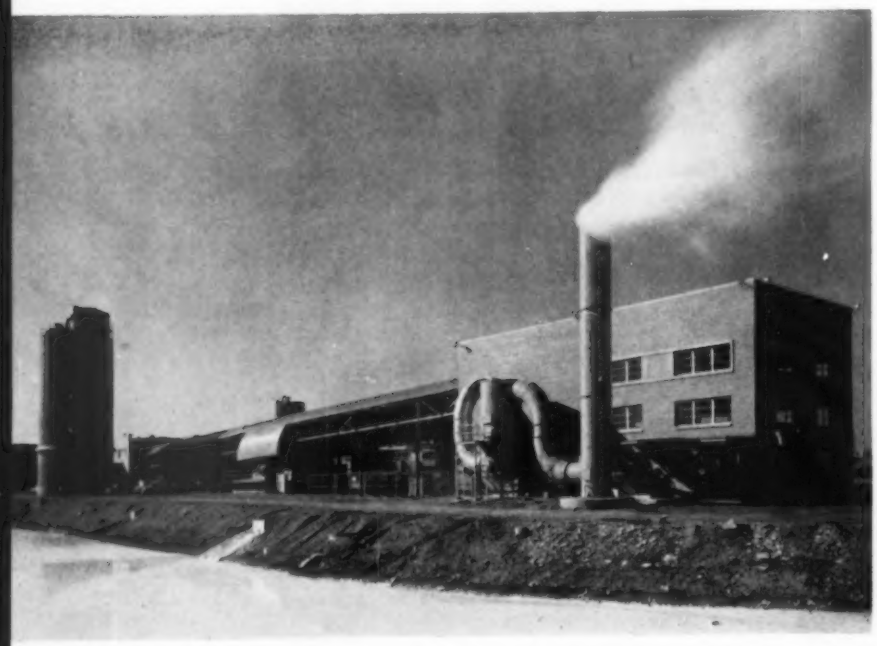
By BUREN C. HEROD

ANOTHER ON THE SPOT REPORT

AN interesting example of one of the many applications of lime—a product which, along with many other nonmetallics, is so important to our everyday existence—is found in the new municipally-owned and operated lime plant in the water works of the city of Dayton, Ohio. One of the few such installations in the country, the $1,500,000 facility was placed in operation only five months ago.

Designed by Black & Associates, Gainesville, Fla., as a 150-t.p.d. operation, the plant was erected by local contractors. It incorporates one 9-ft. 6-in. by 265-ft. rotary kiln, and is expected to pay for itself in approximately 10 years. This return of capital investment will stem from the savings realized through attaining self-sufficiency in lime requirements, as well as from the fact that the calcining operation actually produces lime in excess of needs—and the surplus can be sold. Whereas previously lime for treatment had been purchased and completely lost as plant waste, the new system efficiently operates, in effect, on a 100 percent recirculating load in closed circuit. In addition, it effectively removes the problem of waste disposal, and actually makes it possible to reclaim old sludge waste if desired.

Placed in operation just five months ago, the 150-t.p.d. rotary kiln lime plant of Dayton, Ohio, operates, basically, on a 100 percent recirculating load.



Since lime requirements of the water treatment plant — which the lime operation was built to serve—average from 55 to 60 tons daily, about 40 percent of the current 100-t.p.d. lime output can be inventoried or sold. The capacity in excess of present production provides a flexibility that will meet either the greater requirements of a substantially greater volume of water treatment, or an increase in lime production through drawing on old sludge deposits.

There are two basic factors that contribute to the overall efficiency—first, all the lime used in the softening process is recycled and recovered; and second, to this quantity is added the lime that is obtained in treating the water for reduction of carbonate hardness. As described in more detail below, both fractions

leave the water treatment plant in the form of calcium carbonate sludge that is subsequently processed through the lime plant.

An extensive study of operating and economic factors involved in various methods of recovering lime consumed in water softening and treatment preceded the decision to construct the new calcining installation—the latest unit in the nearly 100-year history of Dayton's municipal water works. As a part of this study, city officials and engineers investigated a similar plant operated by the city of Miami, Fla., since 1948 (see PIT AND QUARRY, May, 1949, pp. 106-120).

In effect, the first consideration of a lime plant stemmed from the construction of the city's first water softening installation in 1951-53. Actual water softening was initiated in 1953, and from that time until the new calciner was placed in operation last December, purchased lime was used in the process. However, soon after the treatment plant was completed, attention was directed toward making the unit self-sufficient on lime requirements. This study led to plans for the new lime plant, on which construction was started in August, 1956. The latter was built adjacent to the treatment plant on a property near the center of the city and on the bank of the Mad River.

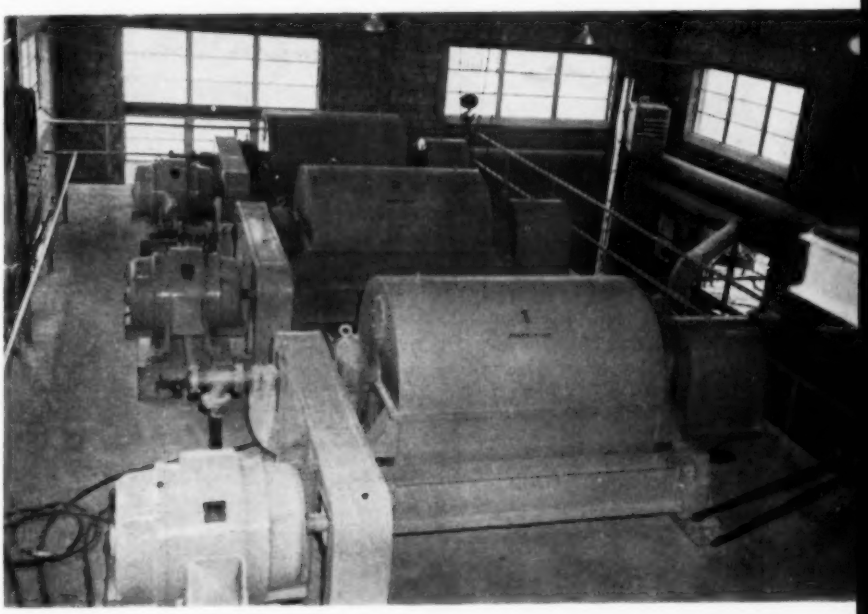
In terms of equipment and operational procedure, there is only a nominal difference between Dayton's lime recovery operation and a commercial lime producing plant. In the case of the former, of course, the feed is composed of a processed calcium carbonate sludge for which special equipment such as a washmill, thickener, centrifuges, pumps, and related controls are required. Aside from the foregoing, lime is produced with standard techniques and handling equipment from the feed to the rotary kiln to its storage as a finished product. For purposes of background information on the feed to the new kiln, a brief discussion of the city water supply system and treatment process follows.

Raw Water Early in 1870, the first municipal water supply for Dayton consisted of a single well 25 ft. in diameter and

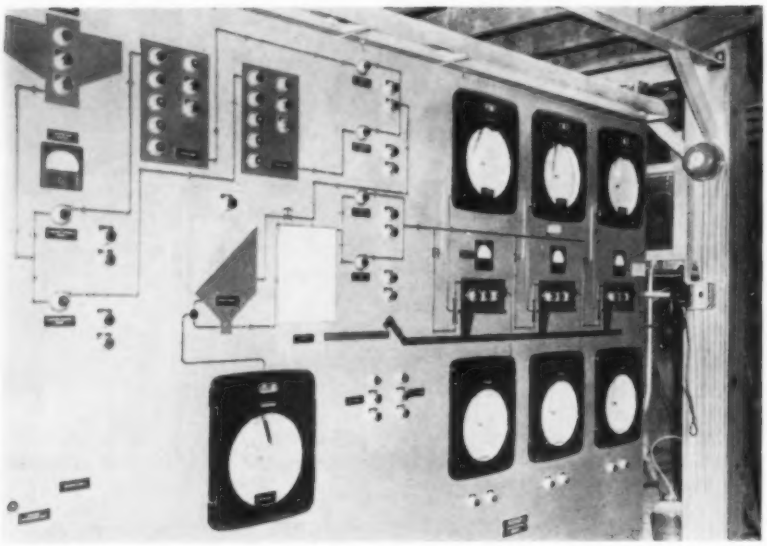
Right: R. C. Stout, right, superintendent of the water treatment plant, and Ralph Taylor, supervisor of the kiln department, the latest unit of the treatment facility.

Below: Sludge is pumped, alternately, from these two agitating tanks to the kiln feed building. These tanks are fed from a large thickening basin.

Below: Solids concentration of the sludge is raised to about 65 percent in these centrifugal filters before the material is fed to the kiln.



A plug conveyor (parallel tubes) transfers sludge from the filter discharge to the kiln.



Schematic representation of sludge flow and operating components from thickener to kiln feed are shown on this control panel in the kiln feed building.

15 ft. deep. Today there are 47 wells, 18 to 38 in. in diameter and from 75 to 150 ft. deep, in a well-field along the Mad River about 3¼ miles east of the plant. Water is pumped from the well field to the plant through an 84-in. conduit. As received at the plant, the water is fairly hard—a breakdown of mineral analysis in raw and treated water is shown in the table.

Softening Process Due to the relatively high non-carbonate hardness of the raw water, the flow is treated with solutions of both soda-ash and lime. The latter is slaked in the chemical house of the treatment plant with resultant milk of lime of pre-determined concentration added to the raw water. Subsequently the flow proceeds through a set of slow mix basins — parallel with flocculator paddle shafts — then sedimentation basins, recarbonation basins, and then to filters.

From each settling basin, the flocculated sludge is continuously collected by a rake and deposited into sumps. Previously, this sludge had been pumped into large lagoons as waste. However, with the new calcining plant, it is now fed through a closed circuit in which the lime contained is recovered and recycled to the water treatment process. Actually, the new system provides for feeding fresh sludge from water treatment and old sludge from the lagoon, either individually or in combination, to the lime plant. More than a 5-year supply of sludge is available from the lagoons.

Sludge from Treatment The water treatment plant, which has a rated capacity of 96,000,000 gal. per day, treated last year an average of 44,800,000 gal. daily, or more than 16,000,000,000 gal. for the year. Dry calcium carbonate sludge available from this treatment is approximately 2.47 times the number of tons of lime delivered into the process, and is provided by two fac-

Mineral Analysis of Raw and Treated Water
City of Dayton, Ohio
(Average of Monthly Composite Samples)

Ionic analysis	Raw well water (p.p.m.)	Plant effluent (p.p.m.)
Total hardness as $CaCO_3$	357	105
Carbonate hardness as $CaCO_3$	274	39
Non-carbonate hardness as $CaCO_3$	83	66
Average free carbon dioxide as CO_2	13	0
Carbonate as CO_3	0	4
Bicarbonate as HCO_3	334	40
Sulphate as SO_4	85	85
Chloride as Cl	16	16
Calcium as Ca	91	23
Magnesium as Mg	31	12
Sodium as Na	14	20
Iron as Fe	0.15	0.00
Total solids on evaporation	446	209
Average pH value	7.6	9.3

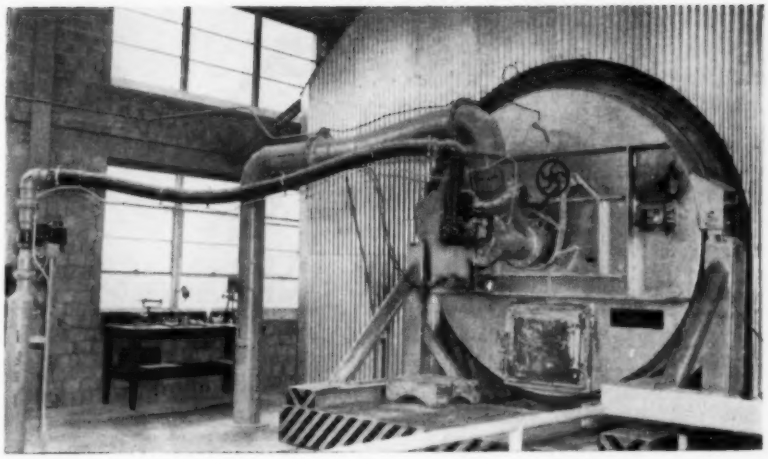
p.p.m.=parts per million ; 17.1 p.p.m.=1 grain/U. S. gallon.

tors noted earlier. First, the lime used in the treatment—which reconverts to calcium carbonate—and second, the carbonate hardness which is precipitated along with the treatment lime in the process.

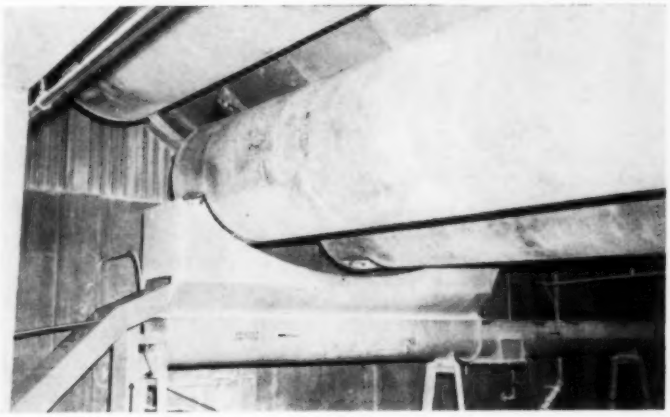
With an application of 16.7 grains of lime per gallon of raw water, standard treatment requires about 2,140 lb. of lime per 1,000,000 gal. of water that converts to approximately 3,825 lb. of calcium carbonate sludge. The reduction of carbonate hardness from 274 to 39 parts per 1,000,000 (or about 13.7 grains per gallon) results in approximately another 1,950 lb., or a total of 5,775 lb. of $CaCO_3$ sludge per 1,000,000 gal. of treated water. In calcining this amount of sludge recovered from treating 1,000,000 gal., the lime plant can theoretically recover more than 3,000 lb. of CaO, or nearly 50 percent over the treatment plant's requirements. The actual recovery ratio is not yet established.

Sludge Preparation The first step in preparing the sludge from the water softening process for feed to the kiln involves subjecting the material to recarbonation, which will redissolve precipitated magnesium hydroxide. As noted earlier, an alternate system provides for pumping sludge from a lagoon, *via* a 300-g.p.m. pump and a 6-in. line, to a washmill. Here enough water is added to bring the sludge to a consistency comparable to that of the fresh sludge from the treatment plant, and it is then passed over a screen for removal of any debris before being pumped to the recarbonation basin. The CO_2 for recarbonation is waste gas pumped from the kiln exhaust system.

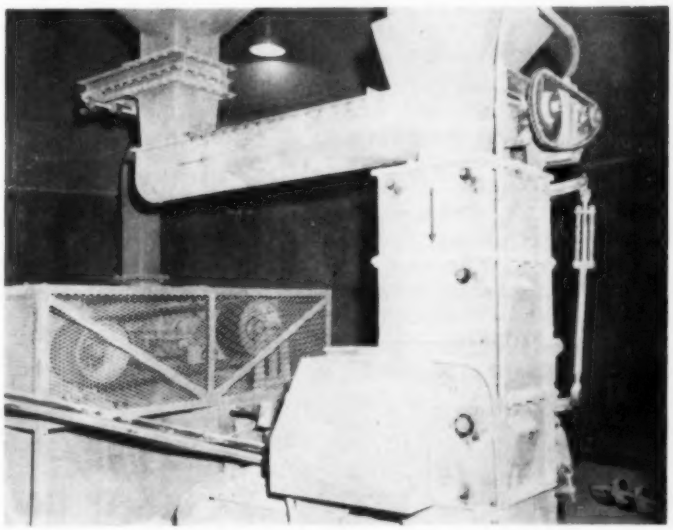
From the recarbonation basin, the sludge is pumped to a large thickening basin, 130 ft. in diameter and ranging in depth from 8 ft. at the outer edge to 15 ft. in the center. The basin has a capacity of 1,000,000 gal. of sludge. At 15 to 20 percent solids, the latter is transferred to a pair of Dorr-Oliver agitating



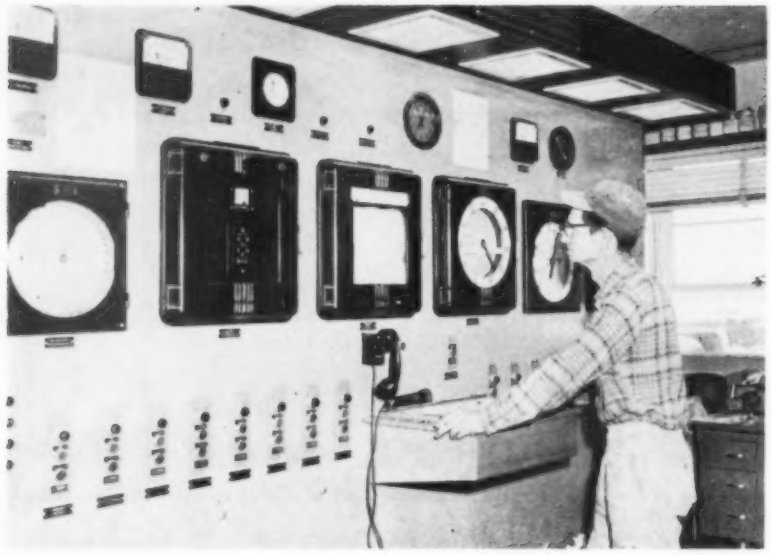
In this view on the firing floor, the hood masks a set of cooling cylinders attached to, and rotating with, the kiln.



The coolers as seen from below the firing floor. Cooling air enters the discharge ports (two seen above the product conveyor hopper) and is drawn into the kiln as preheated secondary combustion air.



This pneumatic conveying system, installed below the finished product storage bin, transfers lime to the water treatment plant, or to a sales bin over a rail siding.



The kiln master control panel is housed in a totally enclosed room adjoining the firing floor.

tanks, each of which has a 100,000-gal. capacity. These are interconnected, and are filled alternately. While one is used to supply the department, the other is filled from the thickener. Either of a pair of Allis-Chalmers slurry pumps beside the agitators is used to transfer the kiln feed to the kiln building, where the material is put through a process unique in lime operations.

At the feed end of the kiln is a 12-ft. square plenum or expansion chamber, into which spray bars are inserted. The latter are drilled with $^{11}/_{32}$-in. holes, and fitted with deflectors over each hole. Sludge pumped from the respective agitator storage tank is sprayed through these orifices into the kiln exhaust gas stream.

Certain advantages are derived from this unusual installation—a reduction of exhaust gas temperature from 450 to about 250 deg. F. before the gases enter a scrubber; a preheating of the kiln feed; and, as a corollary to the latter preheating, a better separation of the magnesium carbonates is attained in the subsequent centrifuging.

Sludge collected at the bottom of the expansion chamber is pumped to a series of three 40- by 60-in. Bird centrifugal filters. Each of the latter is driven by a 100-hp Reliance motor — at a maximum of 1,200 r.p.m. — through multiple V - belts. Solids concentration of the sludge feed is increased to approximately 65 percent. From collecting hoppers below the centrifuges, the filter cake is transported by a Hapman-Dutton plug conveyor, driven by a Foote Bros. gear reducer motor, to a 16-in. Jeffrey screw conveyor and then discharged into the kiln.

The kiln feed building houses a Continental Electric power center panel, and schematically diagrammed Foxboro equipment control panel (see accompanying photograph). Pushbutton controls and recording instruments are provided for all phases of the sludge flow from the thickener through the agitating tanks, expansion chamber, centrifuges, and to the kiln feed screw; and for the kiln exhaust gas system, including transfer of gases to the recarbonation basin.

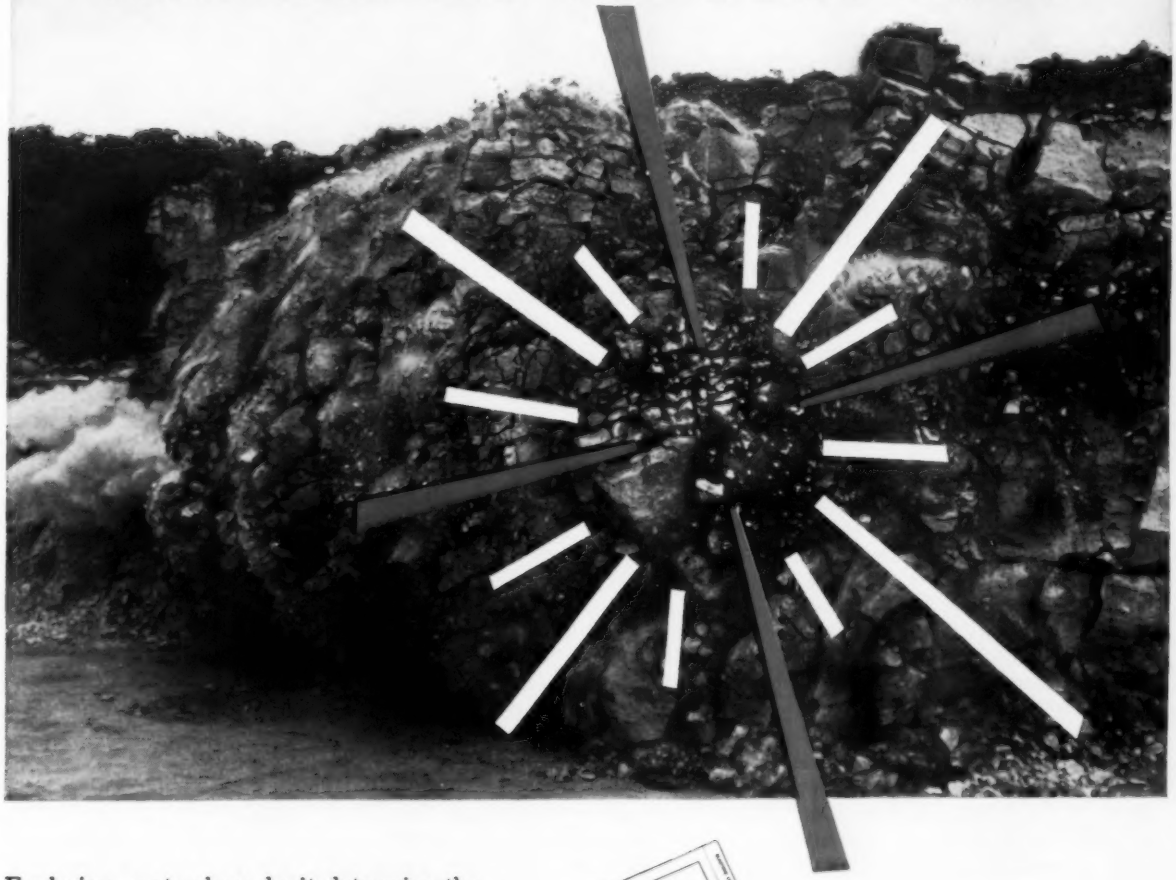
Kiln Department An Allis - Chalmers unit, the new kiln is 9 ft. 6 in. diameter and 265 ft. long; it rides on four tires, and is driven through a Falk reducer by a 100-hp. motor. Auxiliary drive is provided by a Wisconsin gasoline engine. A chain system, in a Texas star pattern, occupies the first 45 ft. from the feed end, an area which is lined with gunite. Starting from the discharge end, the kiln is lined for the first 60 ft. with 70 percent alumina refractories, silica brick for the next 60 ft., and standard refractories for the remainder of the shell up to the chain system. The foregoing are all 6 in. thick. A Plibrico jointless lining was installed in the firing hood.

The chains provide an excellent heat transfer—a drop in temperature from 1,100 deg. F. at the beginning of the chain pattern to 450 deg. at the kiln feed end is realized. Firing zone temperatures are main-

(*Continued on page* 170)

Bulk loading of railroad hopper cars is handled from this 150-ton capacity sales bin. In the background is the treatment plant, for which lime requirements are met completely by the new calcining operation.

HOW MUCH DID THIS BLAST COST?



Explosives costs alone don't determine the value of a given blast. The explosives you use have a direct effect on the whole operation: drilling, digging, hauling and crushing.

You can find out, quickly and easily, the true, complete cost on any blast by using the new, simplified computing method developed by Atlas. It's called the Blasting Cost Chart, and it's yours without cost or obligation.

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Factors in small to

By WOLF G. BAUER
Consulting Engineer

Air pollution, water pollution, and noise—these are the three industrial waste products which our mushrooming towns and suburban districts view with increasing alarm and hostility as plants and residences encroach upon each others' zones of influence. Of these three, the emission of dust reportedly constitutes the most prevalent nuisance, whether this designation is justified or not.

In view of the turbulent intermixing of solids and gases within rotary kiln systems, and the large volumes of gases involved, this type of process equipment is a particularly effective generator of atmospheric dust. The problem of coming up with an effective, low-cost suppression method is one of great interest to the smaller operations.

There are many pitfalls and fallacies in this business of economical dust suppression, and for that reason this series of discussions is aimed at the operator of the small and medium-sized plant. An understanding of fundamental factors should be helpful.

PART I

Dust Suppression And Small Plants As in the cost of all machinery and equipment, the larger the throughput, the cheaper the first cost and operating cost per weight or volume of material handled directly by the unit. Accessory equipment to dust collectors, as well as labor and operational power and expenses, can seriously add to direct production costs in small operations. Due to the fact that the reclaimed dust may have little or no sales value, or that it ties up valuable real estate in waste storage, primary elimination or reduction of dust generated ahead of or within the kiln system is as important as suppression after it leaves the system.

It will further be pointed out in a following installment of this discussion in PIT & QUARRY how the unrealistic air pollution codes of some regions further penalize the small plant when such codes are based on the solids concentration of exhaust gases, either as grains per cu. ft. or pounds of solids per 1,000 lb. of escape gas.

Since the cost of collecting systems for dust is based on volumes of gases handled, rather than on tons of dust collected, it is apparent that such costs are closely related to plant or kiln system production capacity. It has been found that most process equipment follows a $^{0.6}$ power cost relationship or rule which states that the cost of a piece of equipment x times larger than the first will cost $x^{0.6}$ times as much. (By using a double log graph paper, the operator can plot a straight line having a slope of 6 to 10, or 31 degrees, and from it determine the cost ratio increase of equipment and machine with increase in size.) Thus, for example, a 100-t.p.d. operation has double the investment per ton of gas handled per ton of product made, compared to that of a 500-t.p.d. plant, while the 100-t.p.d. plant emits only one-fifth of the dust tonnage into the air, with equally efficient collecting equipment.

Dust Generation—A Double Indemnity Kiln system dust can easily become a many-headed Hydra to the operator of the small plant—for several reasons. Either the dust becomes a neighborhood nuisance and complaint issue, or its presence constitutes a direct loss in raw material. Furthermore, there may be an unseen price tag on the dust even before it reaches the suppression system or the neighborhood. Its generation and presence within the kiln system may already have impaired heat exchange efficiency, combustion, refractory lining, draft gas sampling controls, and metal parts due to abrasion of ducts, dampers, fan wheels, and seals, not to speak of its effects on personnel and machinery.

Basically, then, in view of this double indemnity, it behooves the operator to consider kiln dust suppression, not alone from the final exhaust gas cleaning standpoint, but also from the standpoint of minimizing kiln dust peneration and gas entrainment in the first place. Thus we may distinguish between "primary" and "secondary" dust suppression phases.

PRIMARY DUST SUPPRESSION PHASE

The term "dust" is an extremely generalized designation of fine and small particles which may be momentarily lifted or conveyed by natural air or gas eddy currents or wind. In the most universal use of the word, dust is generally designated as fine material having some nuisance value when allowed to es-

# of Dust Suppression

medium-size rotary kiln systems

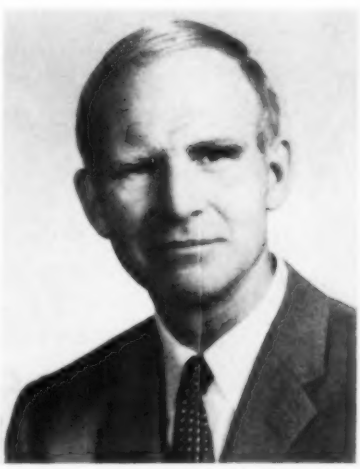
cape and become airborne. While such dust may average around one micron in size, the particle size range of industrial dusts may vary from 50 microns on down, or roughly minus 325-mesh screen size. In view of the greater velocities and turbulency of gas movement within kiln systems, kiln dust will include much coarser particles than that classified as atmospheric dust. The term should be used in a relative sense.

Sources and Nature of Dust Production of dust or fine of particles as we all know, is an ever-present attrition by-product of moving, storing, and processing raw materials. Despite the fact that clean and dust-free material may be supplied to the kiln feed bin, such particles are shattered by free-fall impact, rubbed or abraded by bin charge movement under pressure, and further reduced by sliding and tumbling friction through feeders, conveyors, chutes, and rotating kiln and cooler equipment.

Naturally, the degree of dust generation, or rather fines generation (we might distinguish between these two terms by classifying fines as dust only when gas- or air-entrained), is influenced by the softness, size, shape, volume, moisture, and time of passage of the particular material involved. In addition, under certain conditions of fast drying in the upper feed zone of rotary kilns and dryers, steam spalling, thermal shock, and weakening mineral bonds will produce excessive fines, the small-particle fraction of which will be entrained as dust by the turbulent kiln gases. Normal kiln systems certainly provide ample opportunity for gas pick-up of such fines.

The problems encountered with various material dust in heat processing equipment are not all related to the particular dust itself but also to the conditions of the conducting walls and surfaces within which the gas-borne dust is conveyed, as well as to the nature of the gases themselves. Thus the temperature of the kiln or dryer wall may be such as to entrap the dust particle by virtue of melting at high temperature, or by reason of stickiness due to condensation on surfaces below dewpoint temperature when the carrying gases are near the saturation point. Gas direction in terms of impingement within the system is thus a pertinent control factor.

It is, of course, indicated in each particular case that an economic balance be worked out on how far one is justified to proceed with a primary dust suppression program for the kiln system. There are, however, a number of schemes and techniques that can be applied at relatively little expense. Often the gain in increased kiln output, higher product uniformity, and lower fuel requirements warrant some rather extensive alterations.



Wolf G. Bauer

Control of Potential Dust From Kiln Feed If the potential dust from this source stems from dirt and fines adhering to the sized feed particles, wet or dry scrubbing may be necessary. However, if the material is dry, scrubbing action within the bin may be sufficient. Therefore it stands to reason that fines and dirt should be removed just ahead of the introduction of the material to the kiln, not ahead of the feed bin, as is so often done, so that the potential dust due to bin and storage filling and drawing is also eliminated. This can be done by the use of small grizzlies and screens of a size to handle only kiln feed rate.

If the dust or fines present in the material discharged from the kiln-feed surge or storage bin is only moderate and rather constant, it is, of course, possible to scalp or screen out these fines at the kiln feeder or just ahead of the kiln feed pipe without significantly affecting the overall feed control within the normal fluctuations of volumetric or weight feed rates. On the other hand, if the volume of fines does vary considerably in cycles due to various causes, it is imperative that feed rate to kiln be controlled only with the material so cleaned. While this procedure is a little more involved, it is entirely practical and effective, and can be arranged by means of "overflow-head" feeders (weight or volume), as shown in Figures 1 and 2 covering two different types of feed bin design.

When the raw material delivered to the feed bin was moist and caused fines and potential dust to

22-Year Record

375 UNITS since 1936

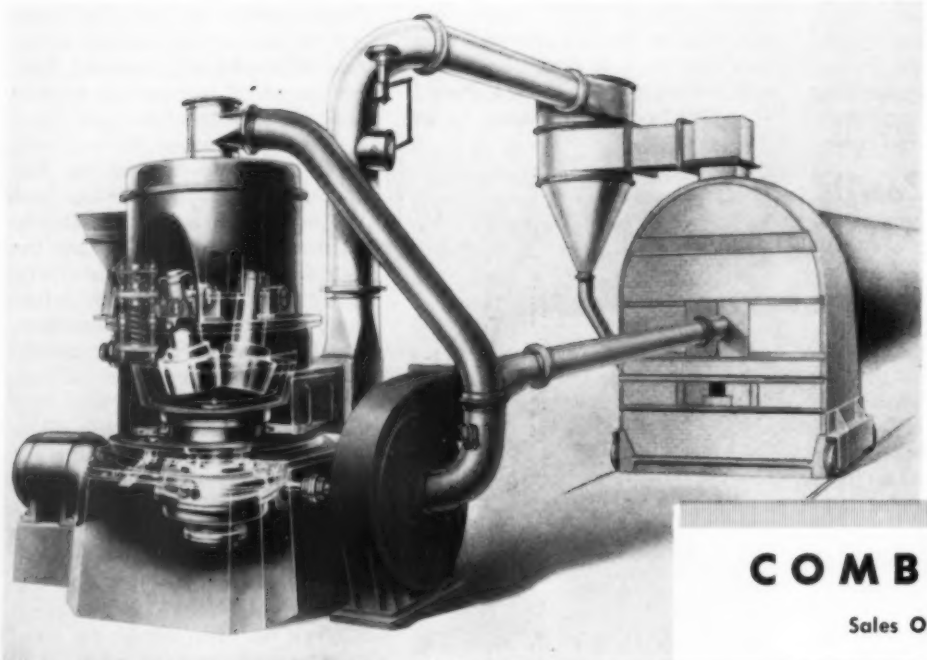
THE development of Raymond *Bowl Mill firing* is another success story of modern industry. Its continual growth in popularity right up to the present date is based on its dependable performance for the past 22 years.

The first experimental Bowl Mill was tested and proved under actual service conditions in 1935. The year 1936 marked the beginning of wide-spread acceptance of the Bowl Mill for direct firing rotary kilns.

The opposite page shows the rapid climb in yearly Bowl Mill output, measured in tons of coal pulverized.

From the original units installed in 1935, the list has grown to 375 mills at the end of 1957. Rated capacity has increased to more than 18½ million tons of coal per year, used in kiln firing alone.

The continued leadership of the Raymond Bowl Mill is a proof of its ability to lower over-all costs and to insure top-level efficiency in kiln operations.



The Raymond Bowl Mill provides a complete fully coordinated system of coal pulverizing and direct firing for rotary kilns in production of lime and cement.

For further details, ask for Raymond Bowl Mill Catalog #75

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adhere to its surfaces, the writer has used angled cross-baffles in the bin hopper section to pass all or a part of the kiln exhaust gases through these open-bottom ducts for drying and pre-heating the feed, and for facilitating fines and dust removal.

Dust Generation Control and Pick-Up In Kiln System Dust production within the rotary kiln, the cooler, or the dryer system is the result of material entrance impact shattering and turbulence, of rolling and sliding bed attrition, of impact breakage from lifters and heat-exchange elements in coolers and dryers, and of thermal shock; or dust may be produced when material becomes fragile, soft, or brittle in the drying or calcining zone. Two approaches must be made, one to minimize dust generation, the other to minimize dust pick-up or entrainment in the gas stream.

In the case of dryers and coolers, heat-exchange elements can be designed to provide minimum fall distance of material. It is often better in such cases, with fragile particles, to segment the cylinder to provide extra cooling or gas contact surfaces over which the material gently slides or rolls, than to use lifters or cascade baffles.

In the case of kilns, the degree of abrasion and attrition is directly affected by the length of the rolling path of each particle during the retention time. Obviously, a kiln pitched at 1 degree slope rotating at 2 r.p.m. will provide twice the grinding action on the particles it would provide if operating at a 2 degree slope and 1 r.p.m. for the same retention time. Soft and fragile materials therefore require gentle-acting heat exchangers, and steeper pitched cylinders rotating at lower speeds. Sometimes it is also necessary to design for larger-than-normal unit diameters to maintain shallow low-pressure loads for minimum particle rubbing pressure.

The second approach, namely that of reducing the dust pick-up by gases or air, is more difficult. In the case of coolers or dryers, lifters can be designed with special prongs, rather than solid shelves, so that the dust filters through the coarse material without being thrown into the gas flow area. As in the case of reducing atrition, segmented non-lifting material spreading elements prevent entrainment. With such segmentation, however, it is imperative that there be no separated gaps, but rather continuous material flow, especially as the material leaves the elevated cells at the discharge end by dropping through the incoming air stream. Figure 3 shows how such entrainment can be prevented with a central ducted discharge device.

It is true that high gas scrubbing action and velocity foster good convection heat exchange, yet it is better with dusty materials to reduce this gas flow energy and turbulency by providing large streamlined cross-sectional areas, and by obtaining heat exchange by increasing material contacting surface instead.

The material transfer points at the feed and discharge ends of rotary kilns are particularly critical with respect to dust pick-up, the latter especially so.

Whether horizontal low-position tubular vibrating feeders or conveyors are used to introduce kiln feed, or whether the entrance of material is *via* inclined chute or pipe, the position with respect to rotation, and the drop distance of the material from pipe end to kiln can be rather critical with many materials. While it is possible at times to provide a slight bend at the pipe end to change the angle of material impact to the minimum, this practice may bring on other problems in build-up and plugging tendencies. If the pipe is always filled and fed out by kiln rotating action, it must be increasingly enlarged in a flare from top to bottom.

Bouncing and dusting can be inhibited to some extent by providing a bell or a flare at the end of a

Figure 1

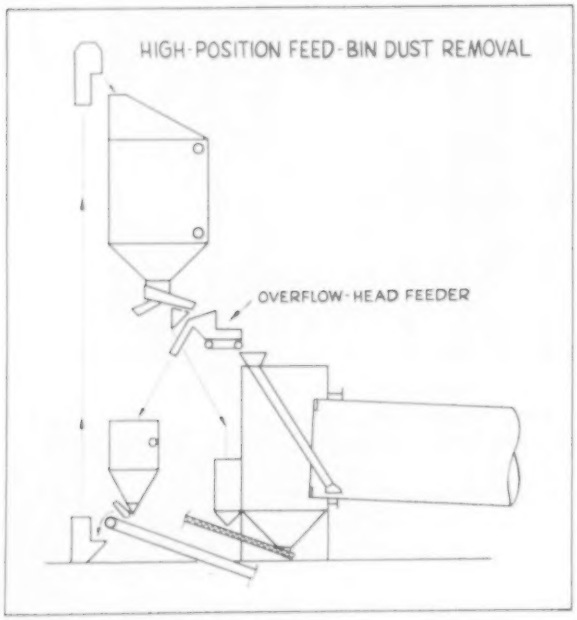
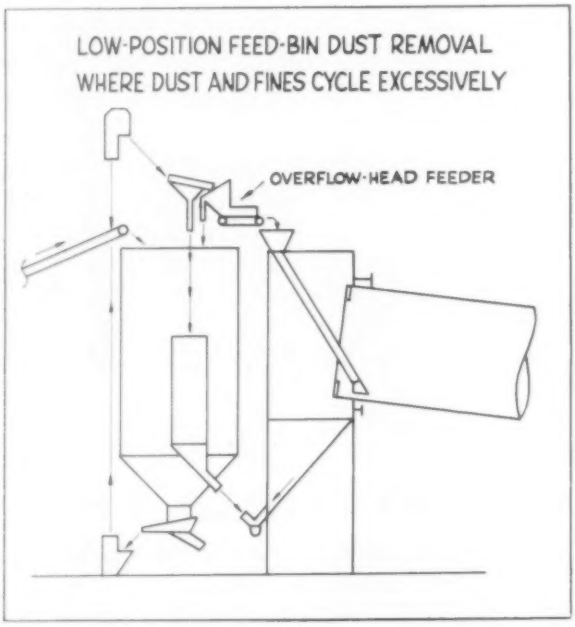


Figure 2



straight pipe, and by bringing the edge of the flare or end very close to the lining, except for a restricted opening facing toward the bed or up-turning side. This shields the material from the gas flow at the moment of kiln impact, prevents build-up of material at the slowing-down endpoint by virture of the enlarged flare or bell, and carries the material away at right angles without interference from the bed on the opposite side.

Kiln to Cooler Dust Transfer Probably one of the most serious and prevalent dust pick-up points in the whole kiln system is in the breeching passage under the firing hood, between kiln and cooler.

Here, accepted design allows kiln discharge material plus fines to fall *counterflow* to strong and turbulent streams of hot air. Designers could not have come up with a more effective dust generating and entraining device. This dust pick-up, furthermore, could not occur at a location anywhere in the system more harmful to the process. Whether such dust here shields flame radiation, inhibits combustion, unbalances flame ignition, cuts operator control visibility, upsets automatic radiation temperature control instruments, or becomes one of the sources of scale and ring formation—any one of these conditions is detrimental to the process.

Some operators have tried to enlarge the cross-sectional area of the up-take in an attempt to reduce the air velocity. Due to turbulency, however, this attempt will eliminate only a very small fraction of the coarser particles, which are not a subsequent air-pollution material in any event.

There are several ways of attacking this problem, depending on the existing design and arrangement and the type of hood and cooler. The writer has used chain curtain with air-quenching coolers, as well as interposed inertial-type separators and fans for handling most of the secondary air for the burners, allowing only a small quantity of low velocity gases to pass up the breeching.

However, basically, there should be incorporated in the hood breeching a solids transfer pipe or duct

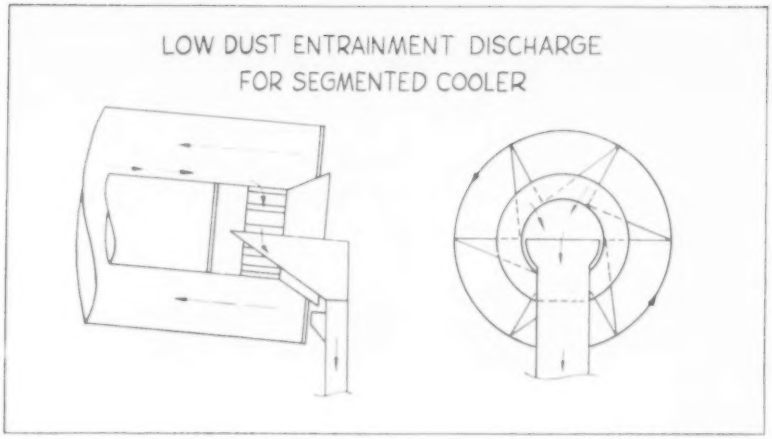


Figure 3

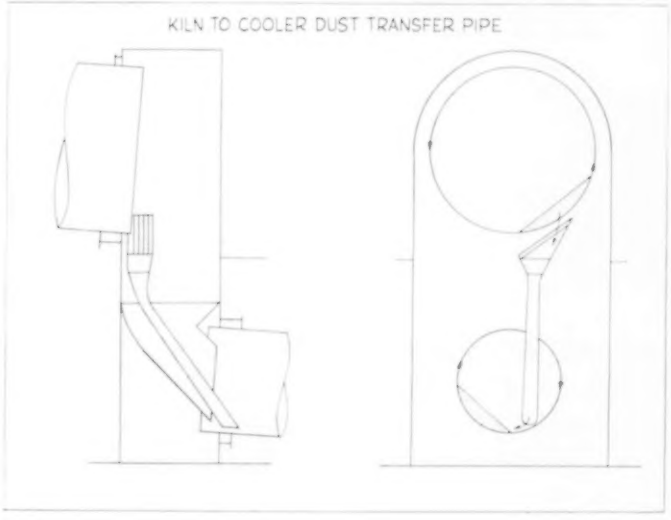
which bypasses the turbulent updraft. In its simplest form, one which is applicable to existing installation modifications, such a transfer pipe, air-cooled or alloy, can be positioned directly under the discharge point of the fines and dust from the kiln end. See Figure 4. This expedient has been very helpful in several installations made by the writer.

There are certain precautionary design measures that should be applied to the transfer pipe. The shape of the intake hopper and pipe bend, if any, must be streamlined. The hopper must be surmounted by grizzly bars of carefully flared designed which allow only a part of the finer discharge particles to pass through the pipe with the dust, thus keeping the pipe scoured clean.

The pipe or duct should be flared downward, if possible, to prevent possible chocking. The grizzly should be accessible with a small cleaning bar. The bottom of the transfer pipe, if it reaches into a rotary type cooler, should be positioned on the down-traveling side of the rotating cylinder. This design may not always be possible, as it is not a good idea to cross the opening to the cooler diagonally. For that reason, if kiln and cooler axes are in line, they should rotate in opposite directions.

It has been shown that a number of measures of a simple nature are at hand to lower the generation and pick-up of dust within the kiln system. In the next discussion we shall consider the secondary phase of dust suppression, and the effect of air pollution ordinances on the small plant.

Figure 4



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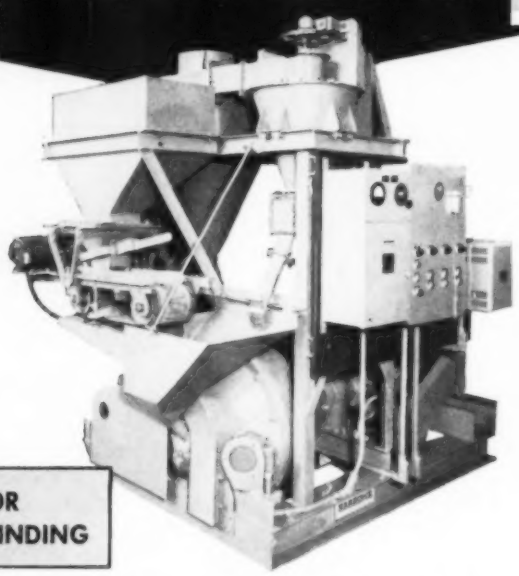

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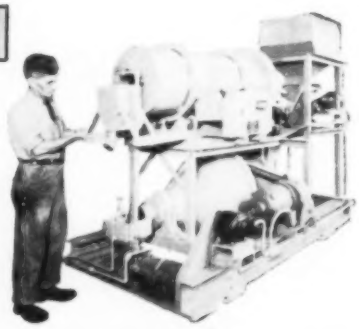
For any small-scale continuous dry grinding or pulverizing problem (such as is found in a pilot plant, laboratory or small commercial process) the Hardinge dry grinding unit is the solution. Completely self-contained and portable, this unit requires only power connections to be placed in operation. Includes Constant-Weight Feeder, "Electric Ear" grinding control, Conical Mill, "Gyrotor" Air Classifier, product collector and dust collector.

FOR WET GRINDING

Hardinge builds a similar unit (right) for small-scale wet-grinding applications. The "package" includes mill, classifier, feeder, "Electric Ear", and launders.



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Rotary Kiln Design

(*From page* 120)

mum flame temperature at about 14 ft. from the firing hood.

The manner in which the above functions to produce stable control is as follows. A pyrometer drop of a few degrees from the desired temperature at which calcination is essentially completed indicates a trace of unburned core—calling for a slight reduction in supply of inert gas to that one jet. This slight reduction produces three results: (1) the maximum flame temperature contacting the product rises slightly; (2) the velocity of the jet decreases slightly; and (3) combustion starts sooner, causing the hottest zone of this jet to move closer to the burner, thus slightly prolonging exposure of the product to increased heat. The trace of core given added heat is converted to lime.

Conversely (assuming a lime rather than cement operation), if or when the product temperature rises a few degrees, the radiation pyrometer provides for an increase in the amount of inert gas before the surface of the product can be overburned. In this case, maximum flame temperature drops slightly, jet velocity increases, and the flame lengthens. Once set manually, there is no need for further adjustment even during a transition from summer to winter conditions.

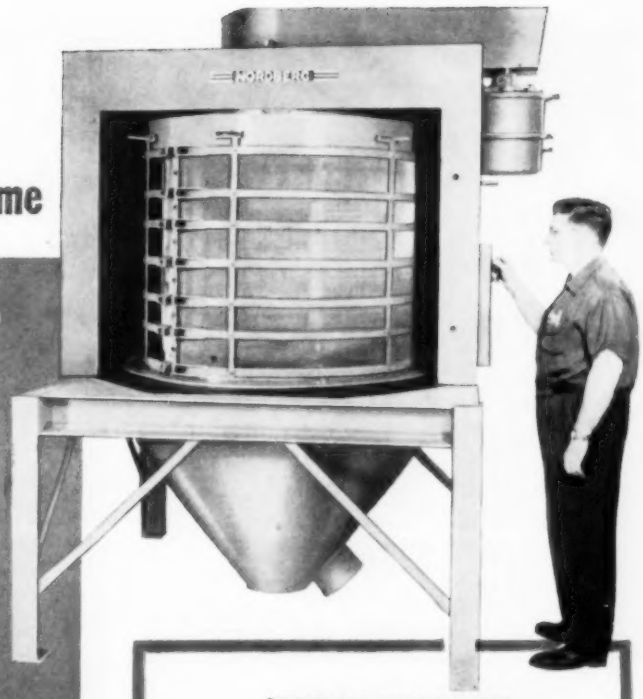
It is indicated that the engineering involved requires broader concepts of scientific and practical considerations than is required in duplicating a conventional kiln system. It is perhaps generally thought that gains in capacity and efficiency effected by the Lepol system and its modifications, as applied in the lime and cement industries, are just a simple matter of the use of a heat exchanger to recover heat otherwise wasted. Closer study indicates that the basic reason for success is quite different, and points the way to greater gains than yet realized.

A prime factor in the accomplishments of the Lepol process is that it *provides the means* to effectively *reduce the wastage of high level heat* (heat above calcination temperature) *to low level work* such as heating stone or slurry, air, and fuel to calcination temperature.

(*Continued on page* 148)

Turn Waste Piles of Limestone into Premium Chips and Ag-Lime

. . . USE SYMONS® V SCREENS



Does the problem of "*too many chips in the fines and too much fines in the chips*" give you a screening "headache"? Or worse, does it result in waste of what could easily be two premium products?

Many limestone producers have found the Symons V-Screen to be the efficient, economical solution to their fine screening problems . . . and many have made premium products of clean chips and ag-lime —even from waste piles of years' accumulation.

This is made possible because an entirely new screening principle gives the Symons V-Screen unequalled high capacity for sharp single cut separations, especially in the more difficult to screen finer sizes. The screening principle employs controlled diffused feed and vertical flow of material with a low rotary speed and high speed gyratory action, combining centrifuge and gravitational force.

Clip and mail the coupon for full details.

SPECIFIC EXAMPLES:

Here are a few typical examples of Symons V-Screen performance on fine screening operations in limestone:

- **Screening out chips from 600 tons of crushed limestone per 10-hour day. Screening with 1/8" square mesh opening, operator is getting about 40 tons per hour of −1/8" and 20 tons per hour of clean +1/8" chips. Even though feed is quite moist at times there is no blinding.**

- **In a similar operation, a 7 mesh square opening of .096" is used on V-Screen to remove fines from 1/4" top size limestone chips. Product is exceptionally clean and stainless steel screen cloth has lasted an entire season.**

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Find out exactly how easily and quickly *you* can cut job delays with these service-proved tires. Call your U. S. Royal Dealer. Or better still—specify "U. S. Royal" on your next new equipment.

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Agstone—Prime Factor In Steady Growth Of Minnesota Producer

ANOTHER P&D EXCLUSIVE

FROM A modest 20,000 tons produced during its first business year in 1941, to almost 135,000 tons in 1957, Bryan Rock Products, Inc., Shakopee, Minn., charts its impressive growth to a high place among the country's aglime producers.

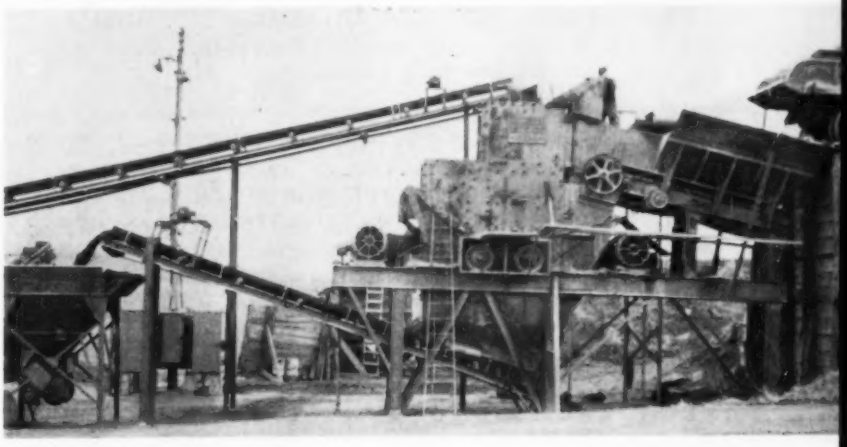
But this is only half of the story—for the annual aglime volume is duplicated by an equal volume of 11 other crushed stone products marketed by the company.

W. L. Bryan, president, attributes the company's growth to four factors: (1) a super-abundance of high-purity stone at a central source; (2) a highly efficient, central crushing installation; (3) operation of an auxiliary, portable crushing plant to accommodate outlying markets; and, (4) imaginative, aggressive promotion of company's products.

The center of the company's extensive quarrying operations is at Merriam Junction near Shakopee, Minn., just off Highway 169, and about 25 miles south of Minneapolis.

From a metropolitan point of view, the Twin Cities, Minneapolis and St. Paul, are the heart of Minnesota. From this hub radiate many

Riprap in the pile (foreground) is scalped off the screen at the left. Throughs are conveyed to the primary crusher (background).



Primary crushing phase of the Bryan stationary plant near Shakopee, Minn. Feed to this plant is maintained at 160 t.p.h.

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You want accurate sizing, good volume and equipment that can stand the gaff when you're running long and hard during peak production seasons.

In short you want DEPENDABLE PERFORMANCE and that's why you want PERFORMANCE PROVEN SECO VIBRATING SCREENS on your job. They're FIRST CHOICE in the slag industry and FIRST CHOICE with thousands of the most successful aggregate producers in the land.

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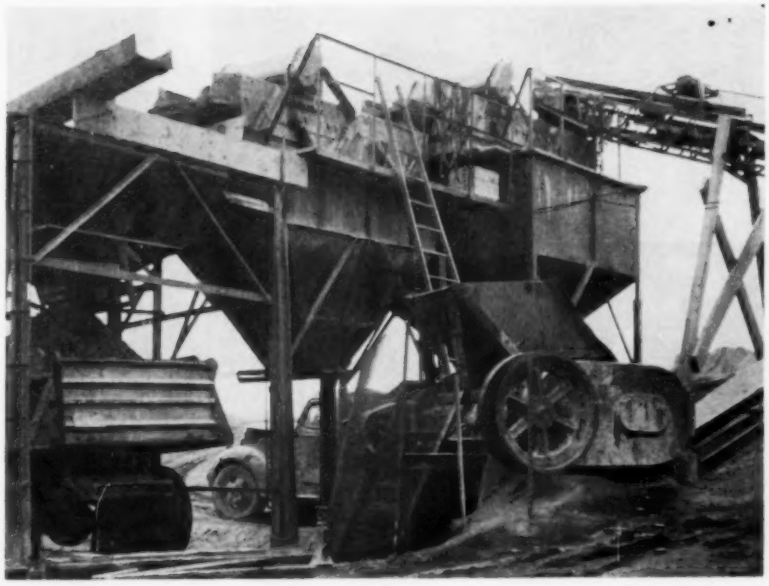
SECO

TRUE CIRCULAR ACTION
VIBRATING SCREENS

From the split made with this screen, top-size material is returned to the primary crusher, and the balance is dropped to the underlying double-roll secondary crusher.

Aglime separated on the two screens at the top is dropped to the bins. Oversize is routed to a roll crusher in closed circuit.



of the state's major highways, and a great deal of heavy construction is centered here. Also, the most fertile farmland is contained in the cluster of adjoining counties. Hence, the concentration of aglime production and utilization lies within 24 counties bordering the Twin Cities. Bryan Rock Products, Inc., ships 500 (70-ton) railroad cars of aglime a year from Merriam Junction, for sale to Minnesota farmers.

"We went into business in 1941," says Mr. Bryan, "with a portable Pioneer crushing plant and a No. 16 Gilson hammermill. We produced only aglime at about 20,000 tons per year. This was delivered to farmers in our immediate area through the Agricultural Adjustment Administration and, later, the Production Marketing Administration.

"Originally, we were known as W. J. Bryan & Son, when my father headed the business. In 1945 we changed the name of the company to Bryan Construction Company and later to Bryan Rock Products, Inc."

The quarry at Merriam Junction is in the Shakopee Dolomite, reddish-colored stone of high purity. It lies in broken strata along two- and three-tiered levels created by quarry blasting operations. The formation crops out at the surface with very little overburden.

"In 1956," relates Mr. Bryan, "we effected a major economy by turning to custom drilling. This is done for us by Quarry Service of Mason City, Iowa. They use a Joy-225, truck - mounted, lightweight, blast rotary drill. Holes of 4½-in. diameter are drilled 22 ft. deep to create the first tier—then another below that.

"The quarry has a 52-ft. face, which we'll drill all the way later. The ledge operation lets us work the softer surface stone when water is being pumped from the quarry floor."

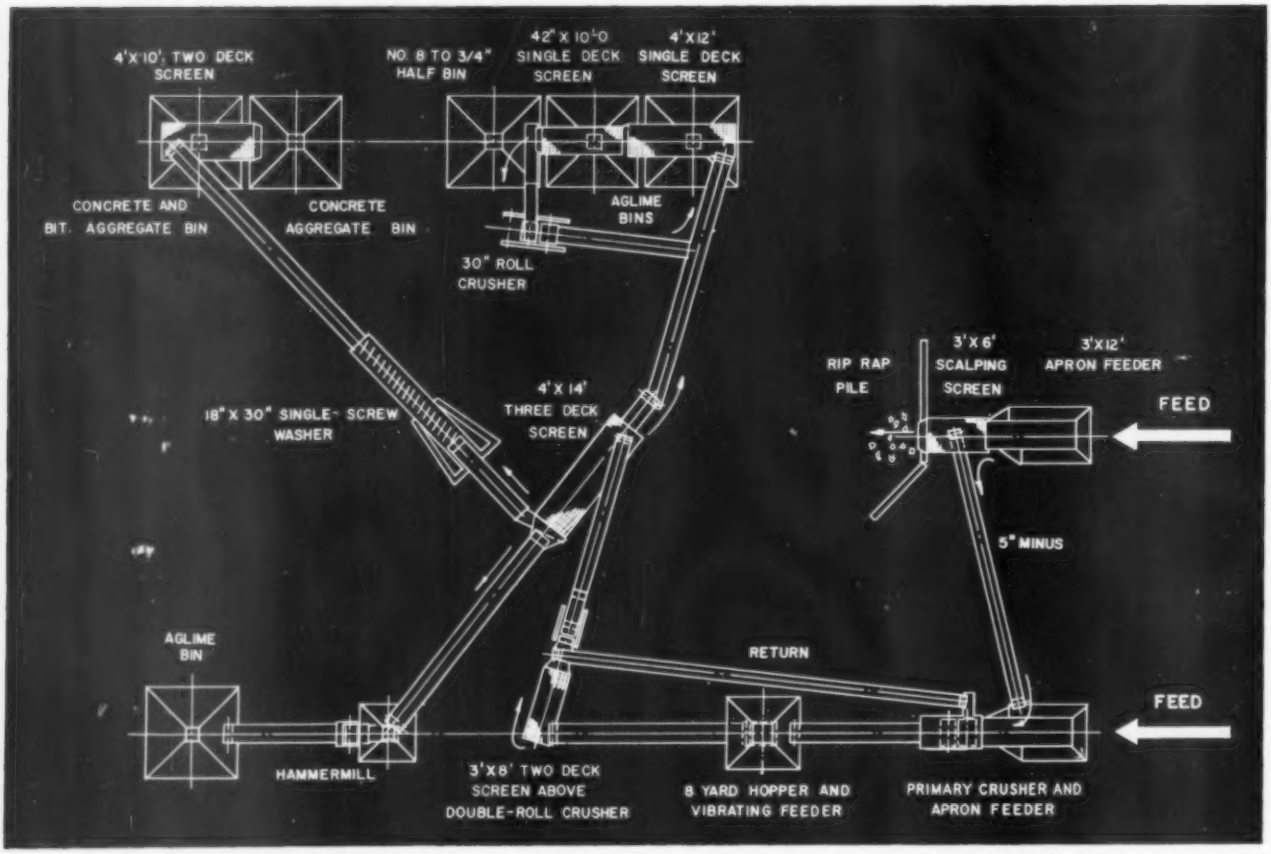
The hardest stone, near the quarry floor, is excellent for road material, but tough on drilling equipment. Quarry Service gets a good average of 40-ft. per hour drilled, but drill bits are good for no more than 60 ft. of 4½-in. hole.

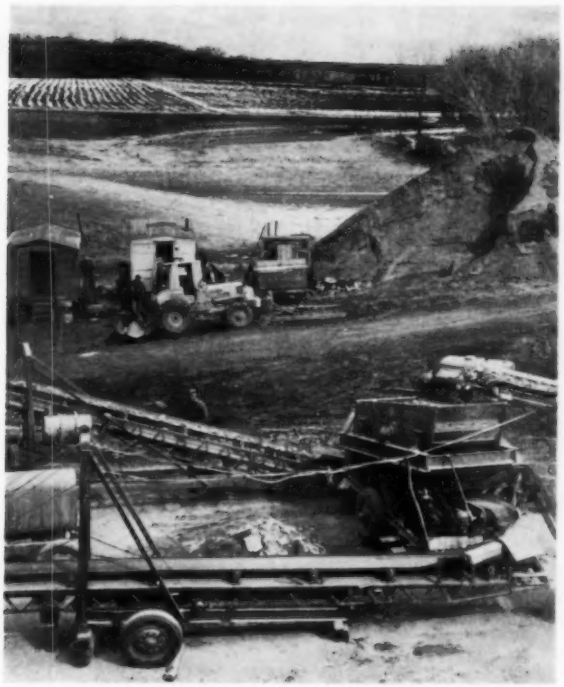
Both dynamite and ammonium nitrate are used as blasting materials. No moisture is found in the drill holes, which are drilled on 8-ft. staggered centers in 10-ft. rows.

An electrically-driven, Universal 3645 Impact Master is the heart of the central crushing installation at Merriam Junction and is backed up by a closely co-ordinated secondary crushing and screening installation. The following is a description of the flow.

A 1½-cu. yd. Lima 604 shovel loads shot material into 6-cu. yd. Mack, International, and Ford trucks. No contaminating material is present, and therefore, no pre-

These four shots (above and on the opposite page) show the complete portable plant setup. Two hammermills mounted back-to-back (above, right) handle fine reduction.





With this equipment Bryan Rock Products Company produces 50,000 tons of aglime each year from a deposit at Stillwater, Minn.

screening or scalping operations are required ahead of the crushing operation.

Quarry-run material is fed to the primary crusher, at the rate of 160 t.p.h., by a Universal 3- by 12-ft. apron feeder. The crushed discharge is then conveyed to an 8-cu. yd. surge hopper above a Simplicity vibrating feeder. The feeder transfers the crushed product to a conveyor belt leading to a 3- by 8-ft. two-deck Simplicity screen.

This screen, located above a 40- by 24-in. Universal double-roll crusher, sends material off the top deck back to the primary crusher, on a conveyor, for further primary reduction. Material passing the screens goes to the underlying double-roll crusher.

Secondary-reduced material from the double-roll crusher is conveyed to a 4- by 14-ft. three-deck Diamond screen from which the top deck retained fraction goes to a Universal No. 4 hammermill. Aglime from the hammermill is collected in a 21-cu. yd. bin by conveyor from the hammermill.

Material off the second and third decks of the Diamond screen passes through an 18-ft. by 30-in. single-screw Eagle Iron Works washer to a 4- by 10-ft. two-deck Simplicity screen. This screen separates the washed material into two products: No. 4 to ¾-in. concrete and bituminous aggregate, collected in one of two 21-cu. yd. bins; and ¾- to 1¼-in. concrete aggregate, collected in the other bin.

Material through the bottom deck of this screen is conveyed to a 4- by 12-ft. horizontal single-deck Cedarapids screen. Material passing the screen is collected in a 21-cu. yd. aglime bin with material over the screen flowing to a following horizontal 42-in. by 10-ft. single-deck Cedarapids unit.

This second screen also takes out aglime for collection in a 21-cu. yd. bin. Oversize is routed to a Universal 30-in. TwinDual roll crusher for closed-circuit operation with the two Cedarapids screens for aglime processing.

Adding complexity to this elaborate, tightly-knit crushing setup is a rip-rap plant located adjacent to the primary crusher. A 3- by 12-ft. Universal apron feeder carries truck-dumped material to a 3- by 6-ft. single-deck Simplicity, heavy-duty scalping screen. Screened material under 5-in. is conveyed to the primary crusher, entering from the right side. Five-inch, one-and-two-man rip-rap (20 lb. to 150 lb.) over the screen drops to a stock pit, where it is loaded out into trucks with a Pettibone 250 Speedall.

From 160 t.p.h. of feed to the Universal Impact Master, 600 tons of aglime and 600 tons of other crushed stone products are produced in an eight-hour day.

The 17-man, central crushing installation at Merriam Junction produces most of the company's output —operating nine to ten months a year. Installed in 1956, it is the second and largest addition to the company's physical plant.

On opposite page— A flow diagram of the Bryan Rock stationary operation near Shakopee.

Bryan Rock Products, Inc., first began large-scale expansion in 1946 with the purchase of a Universal 546P portable primary plant and two Universal No. 4 hammermills mounted back-to-back on a separate truck frame. For ten years this plant was the mainstay of the company's business, operating over a radius of 60 miles from the Twin Cities.

"The function of this plant now," states Mr. Bryan, "is to protect our central business at Merriam Junction, and to take care of outlying markets that couldn't be justified from the central installation.

"We concentrate the use of the portable plant at Northfield, Hastings and Stillwater, Minn. This is a 10-man operation, producing in an eight-hour day, 90 tons of aglime per hour and 115 tons of minus ¾-in. road stone per hour."

"In contrast to our central crushing plant, which operates nine to ten months, the portable is a year-around operation. Usually, we tie it up at Stillwater, Minn., for five months during the winter to stockpile 50,000 tons of aglime.

"We use the portable not only for aglime and road stone, but also for ballast. In 1957 we made with it 70,000 tons of railroad ballast at Northfield, Minn., for the Minneapolis, Northfield & Southern Railroad."

At Stillwater, the plant functions as follows: the quarried material (limestone) is loaded with a 1-cu. yd. Lima shovel into 6-cu. yd. trucks. A Universal 2036 jaw crusher performs primary reduction, and the crushed material is carried from the front-delivery conveyor to a 4- by 12-ft. two-deck Simplicity screen.

Material off the top and second decks of the screen is conveyed to the two Universal No. 4 hammermills. One of these is driven by a Caterpillar D-1700 and an International UD18A diesel belted together. A GMC twin 6110 diesel recently has been purchased as a new power unit for the other hammermill.

Material from the screen and from the two hammermills is conveyed to a 21-cu. yd. bin for transfer to stockpiling trucks. The ¾-in. road stone is manufactured by changing screen cloth and adjusting the size of the discharge from the two hammermills.

Charles S. Bryan, secretary-treasurer of the company, has done an excellent job of promoting aglime sales with the aid of a lime "calculator." The latter was a feature on the program of the recent National Agricultural Limestone Institute convention in Washington.

Two cardboard discs of different diameters are joined in the center, and both may be turned freely in relation to each other. Around the perimeter of the smaller inner disc are listed crops classified as to degree of soil alkalinity. By moving an arrow printed on the inner disc to pH soil graduations on the outer disc, the user may readily determine the number of tons of aglime per acre required for many different types of crops in different soil conditions.

These lime calculators, which have been distributed by the thousands, have noticeably stepped up interest in soil-testing since farmers must know the pH values of their soils in order to use the calculator.

The first big road contract undertaken by Bryan Rock Products, Inc., was a three-month contract in 1950 to produce a crushed stone base on Minnesota Highway 30 between Blooming Prairie and Hayfield. The portable Universal 546P was moved to the job site, and the material was crushed under a sub-contract from J. V. Gleason, a Minneapolis bituminous contractor.

It was the installation of the central stationary Universal 3645 Impact Master plant in 1956 that freed the portable for a joint crushing operation with Fisher Construction Company, Farmington, Minn. Together, 54,000 tons of crushed stone base were produced for Highway 57.

In 1957 the central plant supplied 32 cars of crushed stone per day for the first stretch of interstate highway in Minnesota from Medford to Owatonna. Prime contractor on this job was the Woodrich Construction Company, Minneapolis.

Rotary Kiln Design

(*From page* 140)

In contemporary installations, these means have been applied short of possible full potential.

The combustion system and controls described are designed to eliminate, at the source, the formation of slag rings. A practical advantage ascribed is the removal of many of the factors that require a kiln to be taken out of service for repairs.

The patentee provides improvements other than those described above, including: a practical means to furnish a high preheat to combustion air and fuel (which is precluded by the equipment generally used for fuel preparation); a choice of several types of commercially proven preheaters; and a new improved form of indirect heat exchanger for cooling the product and heating combustion air.

It has been generally considered impractical to "soft-burn" dolomitic lime in a rotary kiln. In burning in a shaft kiln, it is common practice to recirculate hot inert gases—commonly known as the Eldred system. The patentee claims the ability to produce 1,000 or more tons per day of any kind of lime or cement, in a single rotary kiln, with a fuel consumption no higher than that now required to produce 400 t.p.d. In effect, thermal efficiency greater than 65 percent is expected—based on the high heat value of the fuel.

Material Service Corporation Launches Towboat *Ida Crown*

The Material Service Corporation, Chicago, Ill., has launched the most recent addition to its fleet of river towboats and christened the craft the *Ida Crown* in honor of the mother of Irving and Col. Henry Crown, founders of the Company.

Built by the Barbour Boat Works, St. Louis, Mo., the craft is powered by 450-hp. twin engines.

The Corydon Crushed Stone and Lime Company has opened a new quarry on a 160-acre tract near Corydon, Ind. Capacity is reportedly 150-200 t.p.h.

Consolidated Rock Products Company, Chicago, Ill., reported a net income of $1,794,773, equal to $1.88 a share for 1957, compared with $2,565,636, or $2.70 a share in 1956. Sales last year totaled $24,887,296, against $30,230,820 in 1956.

Enter 149 on card, page 239 ➔

NORTHWESTS *money makers in* ROCK!

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Here are two Northwests working in the quarry of Passaic Crushed Stone Company at Pomton Lakes, New Jersey. The shovels: a 2½-yd., Model 80-D, and a 1½-yd., Model 6, are loading out rock for the company's new 350-ton per hour crushing plant. Dependability is an important factor here. If the Shovel fails, production fails!

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NORTHWEST

Expanded Plant Serves W. Tennessee Markets

- second agstone facility,
- additional crushers installed by new owners—

By BUREN C. HEROD

ANOTHER ON THE SPOT REPORT

A SUBSTANTIAL part of the agstone market in western Tennessee, an area in which there is a good demand for these materials, is being supplied by the recently expanded and improved crushed stone plant of Lambert Brothers, near Waverly, Tenn. This operation, formerly owned by the Franklin Limestone Company, was acquired by the Lambert firm, an affiliate of Vulcan Materials, late last year.

Soon after its acquisition by Lambert Bros. the plant was revised through the addition of two cone crushers and a hammermill, plus the replacement of an old worn-out jaw crusher with a new and larger unit. The cone crushers were installed in order to provide a greater capacity in smaller sizes, while the hammermill was incorporated to increase the production of agstone materials—a commodity that now accounts for approximately one-third of the plant's average 250 t.p.h. output.

Including agstone, standard crushed aggregates, and ballast stone, the operation now provides about eight basic products. Although marketed primarily in western Tennessee, between Waverly and Memphis, the plant's output also gets into northern Mississippi. Shipments originate predominantly by rail on the L. & N. Railroad.

The property was originally opened by the Franklin Limestone Company about 20 years ago, as an underground operation. However, extraction methods were subsequently changed to open quarrying, only a nominal amount of stone having been recovered through the underground workings.

Last November, soon after the plant was taken over by Lambert Brothers, work was started on the crushing revisions noted above, including the installation of equipment and facilities for greater production of agstone. In addition,

This view of the present open quarry of Lambert Brothers gives an indication of the overburden and gullied top layer of stone that must be removed prior to primary drilling.

the control system was revised with the construction of a central switch house and control panel from which one man controls the flow in all phases from the primary surge pile feed belt to the main screening tower. An independent control was established for the new primary jaw crusher.

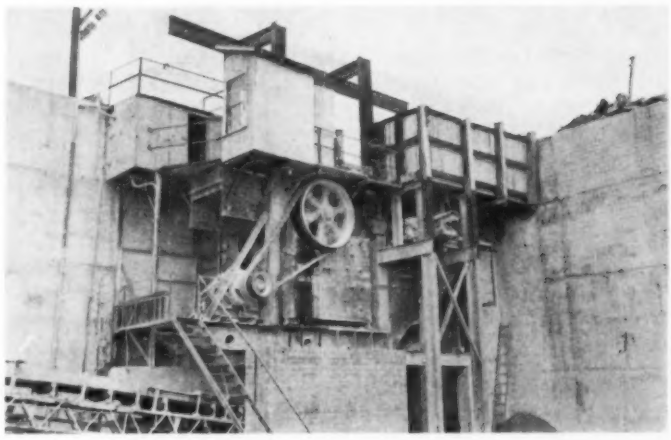
On-the-job supervision of the plant's revision and expansion was handled by A. B. Yearout, the new superintendent of the facility. Prior to his present position, Mr. Yearout had spent two years at Massena, N. Y., where Lambert Brothers were under contract on the St. Lawrence Seaway construction project. (See PIT AND QUARRY, Nov. 1957, p. 114). The improvement program initiated last November was completed late in January this year, and the plant put back into operation.

Situated in a tract of more than 400 acres, the quarry has a face varying from 70 to 105 ft. Currently the entire face height is being worked down to a single level. Removal of the rather heavy overburden—ranging up to more than 30-ft. in places—is handled by a Northwest 80-D shovel, a Caterpillar pan scraper and three Euclid trucks. Some difficulty is also encountered after the bulk of the dirt has been removed, since the top of the formation is gullied by an ancient drainage system long since covered by silt. As much as possible of this material is removed from the gullies by a Bucyrus-Erie machine, equipped with a back-hoe attachment.

When prepared to the extent possible by the above equipment, the rough top ledge is drilled for levelling blasting by a Gardner-Denver Air-Trac equipped with a 1¼-in. diameter bit. This unit drills to a depth necessary to provide a level surface after loading out for subsequent primary drilling.

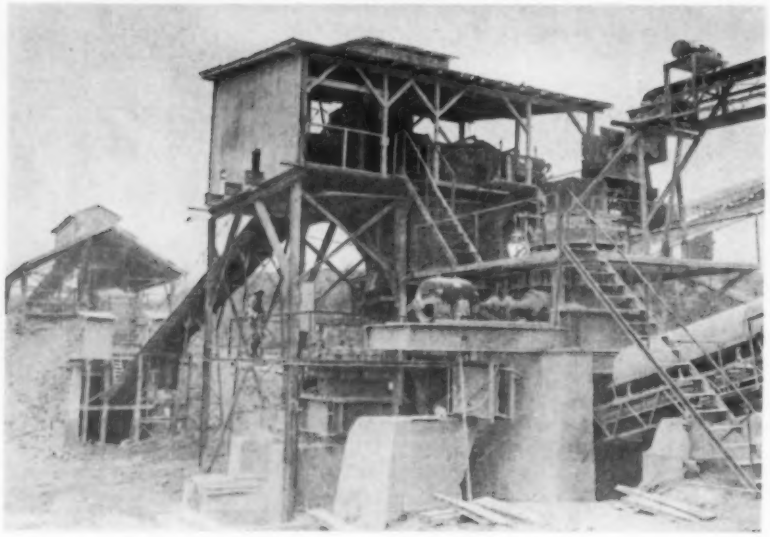
The latter operation is carried out by a pair of Bucyrus-Erie churn drills with which 5½-in. holes are drilled in one or two rows on a spacing of 17 to 20 ft. between holes

J. Barnett, left, quarry supervisor, and A. B. Yearout, plant superintendent. Both men came to this site from the Lambert Brothers operation on the St. Lawrence Seaway.



This new 42- by 48-in. primary jaw crusher was installed a few months ago in replacement of an old, smaller unit.

The plant as seen from the primary crusher. To the left of the surge pile is the newer agstone production facility, and a stockpile of finished material. To the right is the older plant, which also houses agstone production equipment.



Two new cone crushers were added to the existing secondary crusher during the recent plant expansion. Housed above is the scalping screen. The primary surge is in the left background.

A dry cleaning screen above the bin at the left is fed from the bins in the old plant, background. As shown, products may be chuted to rail cars or drawn into trucks.

The newer agstone plant incorporates a 6- by 14-ft. triple deck screen, and a 33- by 40-in. hammermill. It may be supplied from either the scalping screen (scalper throughs), the intermediate screen, or both.

and about 14-ft. burden. DuPont explosives are used in the blasting but percentages are varied in accordance with hole load. An excellent fragmentation has been realized in almost all sections of the quarry. Any secondary breakage required is handled by a Link-Belt crane from which drop ball is suspended.

In the quarry broken rock is loaded out with a Bucyrus-Erie 54-B electric shovel. Haulage to the primary crusher hopper is handled by three 15-cu. yd. Euclid end-dump trucks. Below the dump hopper a 5- by 14-ft. Traylor apron feeder transfers the stone to the new primary jaw crusher, a 42- by 48-in. Telsmith, which replaced the old 40- by 42-in. unit.

Crushed stone reduced through the 6-in. setting in the primary crusher is transfered on a 36-in. inclined belt conveyor to discharge on the primary surge pile. A Jeffrey vibrating feeder in a tunnel below this pile transfers the stone to a second 36-in. belt on which the crusher-run product in carried to the scalping tower. Here the material is discharged on the 5- by 10-ft. double-deck Pioneer scalping screen that is equipped with 3½-in. and 1¾-in. opening screen cloth on the top and bottom decks, respectively.

Those fractions retained on these two decks are chuted to a 4¼-ft. Symons short head cone crusher, for the larger stone, and a 4-ft. short head for the smaller. Bottom-deck throughs are chuted to a third 36-in. belt, or, via flop gate, to a lateral conveyor for transfer to the nearby agstone plant that was constructed in the recent expansion program.

The above cone crushers discharge to No. 3 conveyor, on which their products are transferred to an intermediate screen tower. This installation houses a 5- by 10-ft. Tyler Ty-Rock equipped with screen cloth of 1¾-in. openings on the top deck and 1-in. openings on the bottom. The top-deck retained fraction may be chuted to a 4-ft. Symons

short head, a unit that was already in place when the plant was acquired by Lambert Brothers; or the material may bypass this crusher for feed to the agstone plant.

Material retained on the bottom deck of the intermediate screen may go any one of three ways—to an underlying railroad ballast pile; back to the above 4-ft. short head crusher, or to the new agstone plant. Bottom-deck throughs are chuted to a 30-in. conveyor for transport to the main screening tower where additional agstone as well as standard aggregates are processed.

The latter structure houses four screens mounted above a series of truck- and rail-loading bins with a capacity of 700-tons. Finished products desired are made in accordance with screen changes on these units. Two screens on one side of this finishing tower are supplied by the belt conveyor from the intermediate screen tower. From the underlying bins, stone may be sent to either a Williams or a Jeffrey hammermill, which reduce the stone for agstone production. From these two hammermills the fine materials are raised in a bucket elevator to discharge over the other two screens in the primary screening tower, and the finished sizes are then chuted to the appropriate bins.

Finished fractions may be drawn from any bin in the main tower to a 24-ft. inclined belt, on which they are transferred to a 4- by 12-ft. Tyler Ty-Rock dry cleaning screen mounted over a 75-ton two-compartment tank. This dry cleaning screen is equipped with a ¼-in. opening bottom deck, while the top-deck screen cloth is varied. Products retained on the top deck are chuted to railroad cars or trucks. Fractions retained and passing the bottom deck are chuted into the respective compartments of the underlying tank. From this point they are drawn into trucks for stockpiling or delivery.

The newer agstone installation constructed near the intermediate screen tower is supplied from the latter point by a 30-in. horizontal belt conveyor. As noted above, materials supplied may come from the scalping screen or the intermediate screen. All feed entering the new agstone plant is passed over an Allis-Chalmers 6- by 14-ft. triple-deck screen on which the cloth is varied in accordance with larger fractions desired.

Material retained on the top deck is chuted to the new hammermill, a 33- by 40-in. Cedarapids unit. That retained on the middle deck may be chuted to an underlying bin or may be fed to the hammermill. The same holds true for the bottom-deck retained fraction. Bottom-deck throughs, however, are chuted to a bin from which they are drawn to a 24-in. inclined stacker belt. Further flexibility is provided by another 24-in. belt conveyor mounted along side the bins. Those coarser fractions stored in the bins may be drawn to this belt for transfer to the hammermill. This crushing circuit is closed by a 24-in. conveyor returning the product to the agstone screen feed belt.

A new concrete block control and switch house was constructed to provide a central power station. From this point electric power is supplied to all points from and including the primary surge feed belt through the main screening tower. With respect to the crushing equipment, all units except one short head that is fed 440 volts, are provided with 2,300 volts. Connected horsepower for crushing is 250 on the new primary jaw, 300 on the new hammermill, and 200 on the cone crushers.

In addition to making the operating revisions described above, the company has also taken steps to facilitate maintenance and repair of rolling equipment. A new grease pit structure was added to an existing large shop and parts building; it was constructed to a height which would allow raising a Euclid dump body to full dump position to provide ease of maintenance and lubrication. Drums of lubricants are stored in a room adjoining the grease pit, and are supplied with compressed air through lines leading to a compressor in the shop. A steam generator has also been provided for cleaning the equipment.

Operations of this recently expanded facility are handled by a 43-man crew, including two night men, under the supervision of Mr. Yearout. J. Barnett, quarry superintendent, with Mr. Yearout, had formerly been at the Lambert Bros. St. Lawrence Seaway job. Top officials of the company, which also has plants in Kentucky, North Carolina, and other points in eastern Tennessee are W. E. Lambert, president and general manager, John Lambert, vice-president and J. B. Lambert, vice-president.

Canadian Cement Output Shows Increase in February

Canadian manufacturers of portland cement shipped or used 183,123 tons of cement in February, 1958, compared with 218,199 tons in the previous month. In 1957 the February shipments amounted to 210,991 tons. Actual production for February, 1958, was 334,539 tons, compared with 355,938 tons in the corresponding month of 1957.

Production, Shipments and Stocks of Portland Cement

	February		Jan.-Feb.
	1957	1958	1958
	(Short Tons)		
Stocks, beginning of period	504,906	561,474	453,041
Production	355,938	334,539	661,169
Shipments to customers; used at plants	210,991	183,123	401,322
Stocks, end of period	649,853	712,890	712,890
Exports—Feb.	2,933	1,156	3,504
Jan.	1,767	2,348	2,348
Imports—Feb.	2,981	...	...
Jan.	1,767	...	...
Dec., 1957	4,075	...	...

125th Anniversary Marked By Reading Railroad

The Reading Railroad, Philadelphia, Pa., is observing its 125th anniversary this year. The history of the road dates back to 1833, when the feasibility of supplying transportation services to Pennsylvania's growing coal industry influenced the founding of the railway. The inaugural trip was made in January, 1842, with 2,000 passengers aboard. The run was from Pottsville to Philadelphia.

Today the corporation is a $450,000,000 business operating a 1,300-mile railway system.

producers report on methods, problems in

Kiln Ring Removal

SHOOTING down or reducing clinker rings, build-ups, or balls which form all too often in rotary kilns is now the recognized method of removing them. This was proven in a recent survey conducted by the Remington Arms Company, Inc., Bridgeport, Conn., Industrial Division. This survey substantiated facts previously surmised but not until this time proven from plant operators' experiences.

A questionnaire was sent to all known cement, lime, refractory, and nonmetallic mineral plants operating rotary kilns. Replies were received from 48 percent of them, and 90 percent of these requested a summary of the replies. This proves without doubt that plant managers, superintendents, and engineers are interested in reducing their kiln down-time, increasing their production, and decreasing their operating expenses.

The frequency of shooting was revealing. Among the operators in this group, 19 percent stated they shoot daily, 34 percent weekly, 15 percent once or twice a month, and 32 percent occasionally or infrequently. Magnum shells having approximately 9,000 foot-pounds of muzzle energy are being used in 44 percent of the plants reporting, while Standard 7,500 foot-pound shells are used by 56 percent. The 7,500-foot-pound shells are predominantly used in kilns 130 ft. long or less as the Magnum shells can rebound and damage the rear of the short kilns.

While 78 percent of those replying stated that present-type shells are satisfactory, 41 percent (which included many of the satisfied users) felt they would like more powerful industrial shells. Only 3 percent were interested in less powerful shells. The methods of mounting the gun showed that 79 percent mount it on the kiln hood and 21 percent use a movable mount or tripod.

The number of shells used per ring or build-up varied greatly, as shown in the first table below.

Kiln down-time, during removal of build-ups and rings also showed wide variances as seen in the second table.

Many rotary kiln operators feel that automatic loaders or magazines should be put on industrial guns, so that they can shoot faster. The replies to the questionnaire showed that the rate of firing was far below the scope of the guns. The average number of shells fired per minute worked out as follows:

Cement plants	9 shells per min.
Lime plants	5.5 shells per min.
Refractory plants	12 shells per min.
Miscellaneous plants	13 shells per min.
Average	8 shells per min.

A timed study at one plant showed 1,400 shells fired in 30 minutes by a three-man team, or 46.8 shells per minute. Most plants use two men for shooting build-ups. It must be pointed out that accuracy in shooting, the consistency of the build-up, and the type of ring (peak or tapered) are important elements affecting the rate of firing and, of course, the number of shells used.

Industrial shells can be wasted by using more than are necessary to do the work. Some shooters are "trigger happy," as one superintendent remarked. They just like to shoot, in spite of the heat radiating from the kiln. A slot is provided in the industrial gun cradle for a protective shield, which deflects the heat from the kiln opening and protects the gun operator from the hazard of flying clinker particles. As the kiln openings for the guns vary, the protective shields are made up by the kiln operator to fit the particular kiln opening.

In former years kiln room employees disregarded the normal kiln room and shooting noises. Today employees are noise conscious, and it has become necessary for industrial gun manufacturers to provide mufflers for their guns. Actually, the mufflers are barrel extensions, which throw the muzzle blasts into the kilns and disseminate the noise.

Many cement, lime, and refractory plants continue to use old rotary kilns because of the tremendous cost of more modern kilns. The resulting kiln room dust seeps

(*Continued on page* 166)

	Variance	Average
Cement plant	25 to 3,500 shells	426 shells
Lime plants	100 to 1,700 shells	575 shells
Refractory plants	15 to 7,000 shells	554 shells
Miscellaneous plants	150 to 2,000 shells	1,071 shells
All plants	15 to 7,000 shells	507 shells

	Variance (Minutes)	Average (Minutes)
Cement plant	10 to 255 min.	52 min.
Lime plants	20 to 360 min.	104 min.
Refractory plants	15 to 120 min.	45 min.
Miscellaneous plants	5 to 480 min.	82 min.
All plants	5 to 480 min.	63 min.

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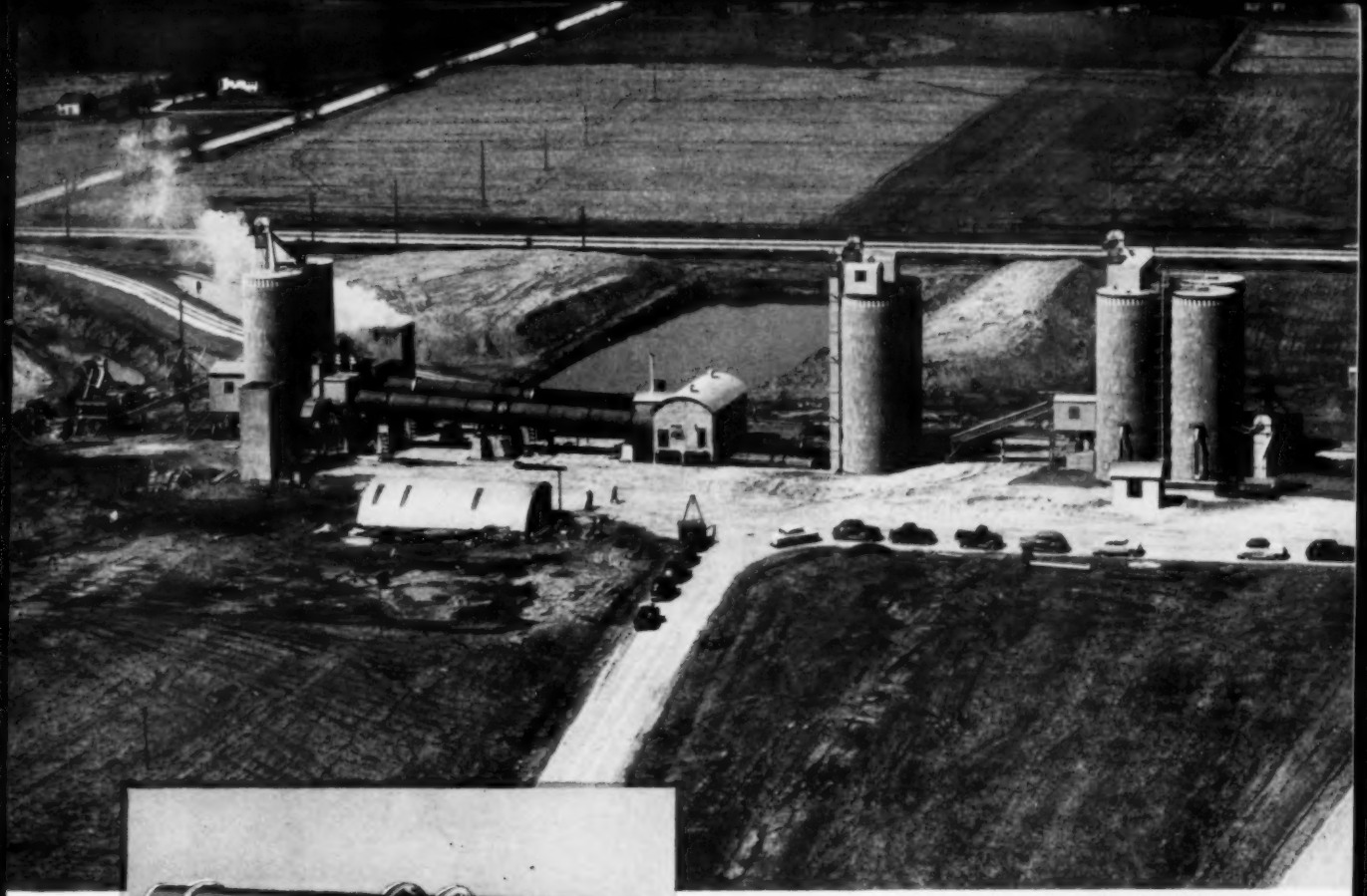
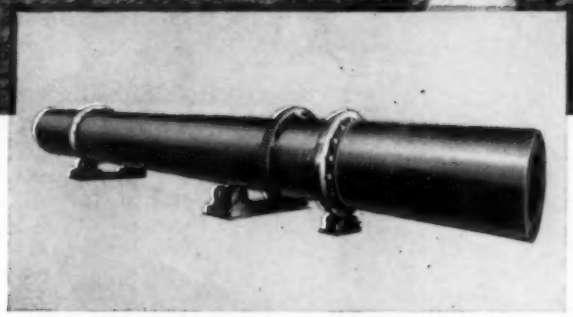


Buildex, Inc., Ottawa, Kansas. Capacity: 600 yd. per day.



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Loading the new 50-ton lime transporter at the Imperial Chemical Industries quarry, Buxton, Derbyshire.

Two Special Lime Vehicles For Imperial Chemical Industries, Ltd.

By J. GRINDROD

TWO new types of lime-carrying vehicles have recently been placed in operation in Britain by the Lime Division of Imperial Chemical Industries Limited—one for hauling quarried limestone from the face to the crushing machinery, and the other for bulk deliveries of "Limbux" hydrated Buxton lime.

The normal payload of the giant quarry truck is 50 tons of limestone. The tractor is the first of a number to be built by E.R.F. Ltd., Sandbach, Cheshire. Together with its semi-trailer, made by the I.C.I. Lime Division, the complete outfit weighs approximately 80 tons when fully loaded, and it will not be used on the highway.

To provide the power necessary to haul this heavy load, a Rolls-Royce six-cylinder engine developing 200 b. h.p. and torque converter is employed, together with a specially designed David Brown gearbox and hypoid and differential gears in the rear bogie axle drive. The main gearbox is so arranged that the first of the three forward speeds effects a reduction from the engine driving speed, the second gear is a

This 15-ton enclosed carrier transports finely powdered Limbux to I.C.I. customers.

Right: Rear view of the Limbux carrier shows the controls for discharging the 14-ton load.

direct drive, and the third gear is an overdrive ratio.

Direct drive is sufficient to propel the loaded vehicle, and overdrive can be used when traveling empty. Thus the reduction first gear is left for abnormal conditions or emergency. The required gear is selected while the vehicle is stationary, and the converter adjusts the torque step-up automatically when traveling, so that the vehicle has, in effect, two-pedal control.

Limbux, which is transported by the other new type of I.C.I. vehicle, is made by a scientifically controlled hydration of specially selected Buxton lime, followed by multi-stage air-classification to give an extremely fine powder that is free from impurities. It is used extensively in a wide variety of industrial processes, particularly those requiring a high standard of purity. Until recently it has been packed and delivered largely in paper bags.

A survey carried out by the Lime Division, however, showed that advantages could be offered to I.C.I. customers if Limbux were delivered, in reasonably large quantities, into storage vessels on the customers' premises. Apart from economies in packing, considerable potential savings in handling at customers' plants appeared also to be possible in many cases.

After consideration of several types of vehicles, it was finally decided to use an A.C.V. 8-wheel Mammoth Major chassis with an aluminum alloy body built by the Duramin Engineering Co. Ltd. in collaboration with Henry Simon Ltd.

Originally designed to convey flour in bulk, the prototype vehicle was found, with certain modifications, to be eminently suitable for the transport of Limbux. Although the payload is 14 to 15 tons, the extensive use of light alloys has kept the gross weight within the limit of 24 tons.

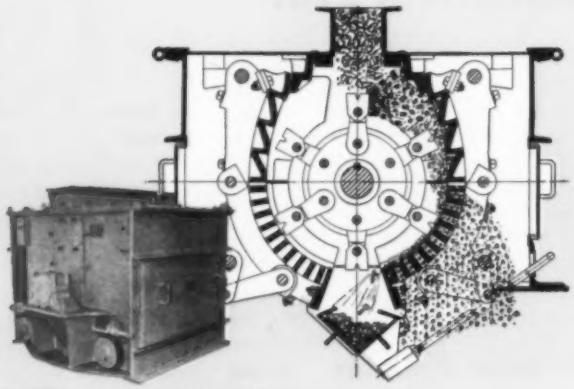
The vehicle has a capacity of just over 1,000 cu. ft., and the floor is divided longitudinally into three hopper bays. At the bottom of each of these is a 9-in. wide air-conveyor leading to two short cross air-conveyors at the rear of the body. These cross air-conveyors discharge the Limbux either to an 8-in. diameter gravity discharge pipe or to two Simon blowing seals which meter the powder into the discharge pipe and ensure an even rate of flow.

Discharge can be made either to ground level or, by means of compressed air, to a point as high as 90 ft. The full load can be discharged to an elevated bunker in about 45 minutes.

Supplying the compressed air are rotary blowers of the Marshall Roots type, mounted on the vehicle and driven from a power take-off at 5 p.s.i. for the air-conveyors and a two-stage rotary blower gives 250 cu. ft. per minute at 20 p.s.i. for elevated discharge. Spillage and dust wastage is eliminated, and the whole operation can be carried out by the driver of the vehicle, since all controls and instruments are mounted on an enclosed panel at the rear of the vehicle.

The New England Lime Company, Adams, Mass., reported a consolidated net income of $335,-112, or $1.70 a share in 1957, as against $355,992, or $1.70 a share in 1956.

REVERSIBLE, ONE-WAY OR NON-CLOG



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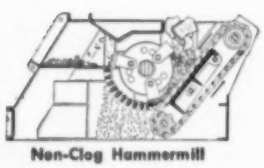
Whatever type of crusher is best for your job, Pennsylvania has it. If it's a hammermill that seems to fit, Pennsylvania makes Reversible and Non-Reversible types for secondary or tertiary crushing where high capacity with low power demand is wanted and a coarse or medium fine product is desired without using a closed circuit system. For crushing wet and sticky feeds, the Non-Clog practically eliminates any trouble from feeds choking up and slowing down production. The continuous travel of the breaker plate forces the feed into the path of the hammers making it impossible for material to build up out of reach of the hammers. Send for bulletins.



Non-Clog Hammermill

Pennsylvania Crusher Division
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aglime, specifications, public relations featured in meeting of Indiana Mineral Aggregates Assn.

By BUREN C. HEROD

THE 1958 annual meeting and convention of the Indiana Mineral Aggregates Association, held at the Claypool Hotel, Indianapolis, on March 31 and April 1, conformed to advance notice and expectations in terms of attendance and interesting subject matter.

For the first time in the history of these gatherings, a part of the schedule was reserved for simultaneous sessions of the sand and gravel producers and the quarrymen. During the remainder of the session, the two groups met jointly.

Topics discussed ranged from a presentation of various geologic factors involved in the aggregates industries to a general report on the highway program activities in Indiana. Specifications on both aglime and aggregates were presented; and critical factors in long-range operating programs, such as land rehabilitation and surveying of potential reserves, were also discussed.

In addition to producer representatives, the list of speakers included top officials of state highway department offices, the state geological survey, national organizations, and members of the Purdue University faculty.

Before the meeting was adjourned new association officers were elected, as follows: president, Roger E. Meshberger (Meshberger Stone Co., Inc.); vice-president, E. H. O'Brien (Interstate Sand and Gravel Co.); and secretary-treasurer, M. G. Johnson (The Merom Gravel Co.).

A new committee was also established by the quarrymen members of the association to study the aglime problems and represent the aglime producers. The chairman and secretary, respectively, of this committee are Arnold Mulzer (Mulzer Brothers), and Lowell Glendening (Mulzer Brothers). Other members are Robert Stewart (Columbus, Ind.), Harold Gorman (Russell-

Roger E. Meshberger, left, new president of the Indiana Mineral Aggregates Association; and Arnold Mulzer, who heads a new aglime committee for the group.

Joe Gray, left, of the National Crushed Stone Association was a guest. Charles E. Casper, right, completed a term as association president with this meeting.

Big ropes for high-speed hoisting system. The shaft served by these hoists goes into an iron-ore mine to a depth of 2200 ft. It is equipped with a man-and-materials cage and two high-speed 20-ton skips. The cage operates at 1450 ft per min; the skips at 2500 ft per min. An interesting feature of the shaft is its circular shape, designed to offer maximum resistance to rock pressure.

The hoists for cage and skips are rigged with Bethlehem ropes of the flattened-strand type. For the cage hoist (foreground), 1¼-in. rope is required. The skip hoist uses the 2¼-in. size.

Bethlehem Steel Company, Bethlehem, Pa. On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation. *Export Distributor:* Bethlehem Steel Export Corporation

Mill depots and distributors from coast to coast stock Bethlehem rope for the following industries and numerous others:

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ville Stone Co.), R. E. Ward (Francesville Stone Co.), and Paul Seitz (May Sand and Gravel Corp.).

Following a report by Ralph Simpson, engineer-director of the association, the meeting got under way with a discussion on a topic of prime interest—aggregate specifications. Farrell F. Havey, engineer of materials and tests for the state highway department reviewed some changing concepts in this field. It was noted that there is a possible trend toward basing specifications on use, rather than class of material.

Comment was also directed toward the allowance of more chert in sub-base aggregates, as these are covered and not exposed to weather, abrasion, and other similar forces. Since chert occurrences must be handled along with other stone in quarrying, it was suggested that more liberal specifications would allow this material in sub-bases and shoulders.

Land rehabilitation as a means of combating zoning restriction was discussed by W. C. Rhodes, secretary-treasurer of American Aggregates Corporation, a firm which has a long record of progressive activities in reclamation. (See PIT AND QUARRY, October, 1955, pp. 80-91.)

Mr. Rhodes also showed a film, recently produced for the company, illustrating many areas of current and completed rehabilitation of pit operations. He noted that because the industry has not impressed the public with its importance, one consequence is zoning—which has eliminated some good deposits. Higher costs and prices have naturally followed.

Lowell Glendening, standing, center, was moderator of this panel during the aglime forum. This discussion followed a paper on agronomy.

A paper on agronomy activities, prepared jointly by Dr. J. B. Peterson, head, agronomy department, Purdue University, Dr. Roy B. Bronson, Purdue University, Gilbert P. Walker, extension agronomist, and Dr. Stanley A. Barber, soil fertility research specialist, Purdue University, was discussed by the authors of the various sections. The paper covered the ASC aglime testing program, returns from liming and the ASC program, plus aglime quality and the potential market in Indiana.

The present aglime testing program has been in effect since July 1, 1957. Prior to that time, samples had been taken by personnel of the various county ASC committees, with a consequent variance in sampling techniques. Since then, sampling has been the responsibility of a technician headquartered in the Purdue agronomy department, an arrangement which has provided the consistency desired.

The proportion of fine material (60-mesh and finer) has been found to be important. Reference was made to recent experiments conducted by the state of Iowa, in which three grades of aglime were compared. These were: 8-20 mesh, 20-40 mesh, and 40-60 mesh. They were disced into the soil in the early spring before seeding alfalfa in oats. It was found the next year that an increase (alfalfa) of 1.7 tons per acre was realized from the 40-60 mesh, 1 ton with the 20-40 mesh, and .58 ton with the 10-20.

Discussion of the potential aglime market in Indiana indicated that, on the average, 76 percent of the soils require liming. The total tons of lime required to bring all Indiana soils up to a pH of 6.5 or higher amounts to 26,800,000 tons. Maintenance at that pH level would, conservatively, require a rate of one ton for each four years.

With respect to fineness, it was noted that experiments have been conducted by ten different research workers on the length of time required by various sizes of particles to dissolve in the soil. Results obtained are shown in the following tabular summary of these studies.

Dr. Duncan McGregor, left, Indiana Geological Surveys, and Ralph Simpson, engineer-director of I.M.A.A. Dr. McGregor discussed the relationship of geology and aggregate specifications.

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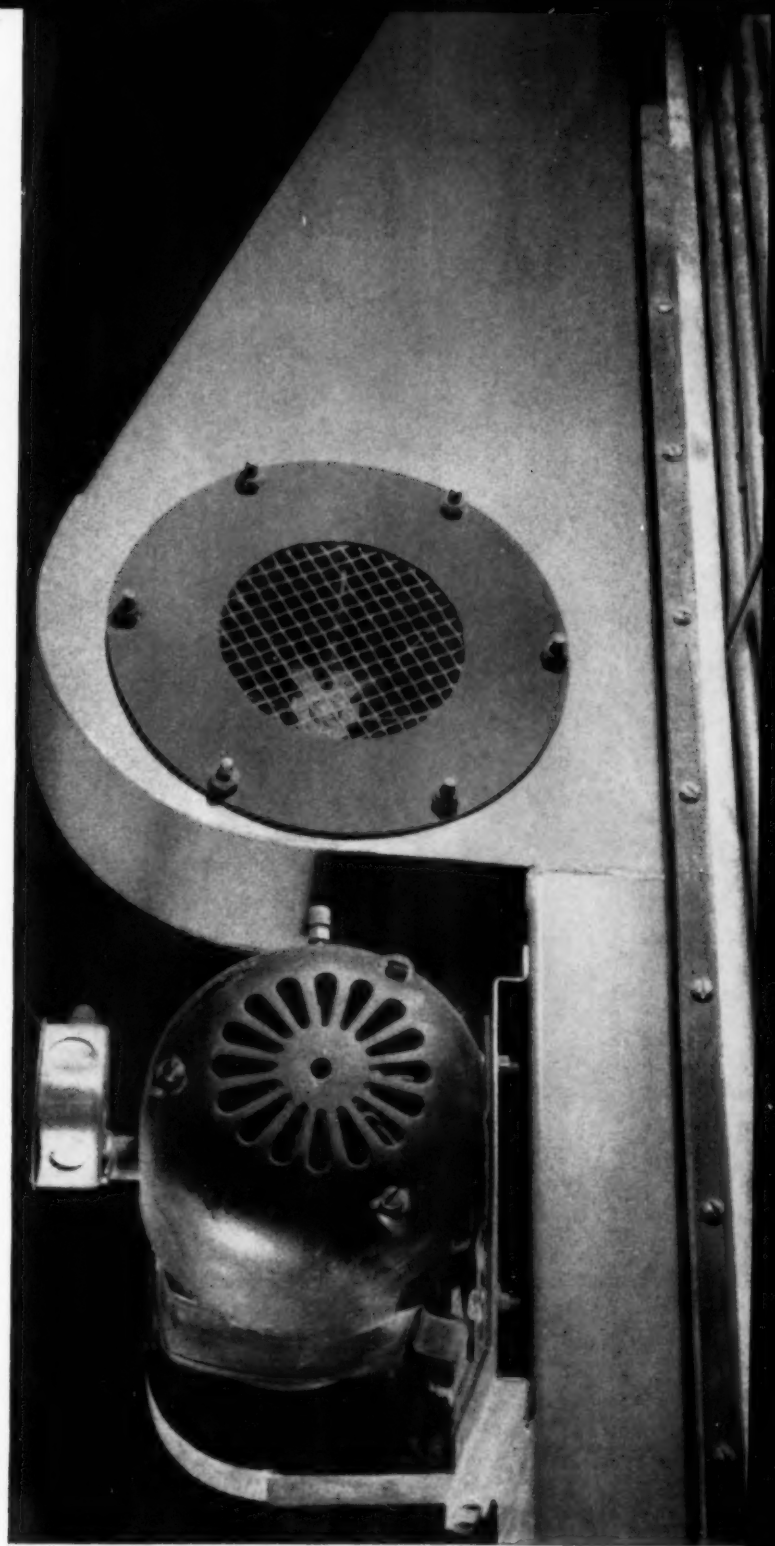

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Particle Size (mesh)	Average Number of Years Calcitic limestone	Dolomitic limestone	Range
4	38	90	11-500
8	19	45	6-250
20	6.6	16	2-19
60	2.0	4.8	0.6-2.7

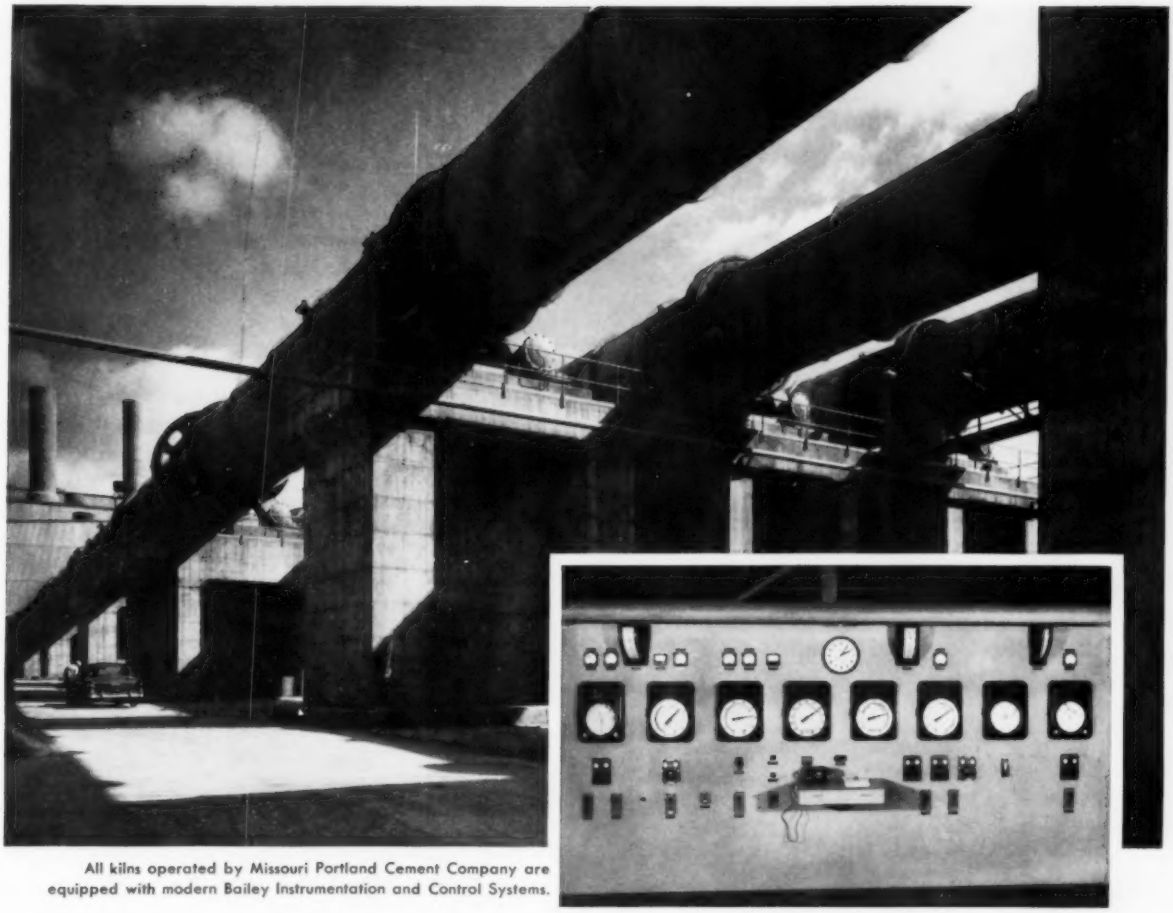
On the average, it was reported, dolomitic limestone goes into solution about half as fast as calcitic limestone, and therefore, finer crushing assumes greater importance.

The various points presented in the above paper, particularly the question of fineness, were considered in a subsequent panel discussion. Members of the panel included the following: the authors of the paper; ASC committeemen R. C. Snoberger and M. K. Derrick; Robert M. Koch, president of N.A.L.I.; and Lowell Glendening, moderator.

Geologic factors in industry operations and aggregate usage were treated in discussions by Dr. W. J. Wayne, head of the glacial geology section, Indiana Geological Survey, and Dr. Duncan J. McGregor, head of the industrial minerals section.

Dr. Wayne described the study of glaciology which has led to the identification and mapping of the greater part of the sand and gravel areas in the state. A growing amount of these reserves, he stated, is being lost to producers through encroachment of urban developments. On the premise that civic planning commissions should take all factors into consideration, it was pointed out that these bodies could get complete information on the location and extent of valuable reserves before plans are made to build over them, thus avoiding a loss to the state.

Several interesting points were made by Dr. McGregor on the relationship of geology and aggregate specifications. It was suggested that a knowledge of an aggregate's geologic origin and properties are as essential as empirical tests in applying specifications. Complete reliance on such tests, it was noted, may overlook potential factors in the action of aggregates in concrete. For example, it was indicated that some materials which have actually recorded good service (*i.e.*, as portland cement aggregates) would be rejected by testing in the sodium



All kilns operated by Missouri Portland Cement Company are equipped with modern Bailey Instrumentation and Control Systems.

How to control the digestion of giant kilns

These giant kilns have delicate stomachs. But the Missouri Portland Cement Company knows how to coddle them to get maximum capacity, uniform product and low fuel rate.

They do it with a Bailey Control System with a central Control Panel where a single attendant has complete control of the variables of combustion and heating.

Because the system keeps continuous chart records, the Burner can check the reading and trend of Kiln Speed, Exit Gas Temperature, % Oxygen in Exit Gas, % Combustibles in Exit Gas, Kiln Shell Temperature, Hood Draft, Temperature of Secondary Air Leaving Cooler, Temperature of Coal-Air Mixture from Coal Mill, Fuel Gas Flow, Feed End Draft, Kiln Speed, Cooler Speed, Cooler Fan Discharge Pressure, Cooler Undergrate Pressure, Cooler Air Flow, Coal Mill Primary Air Pressure, Coal Mill Exhauster Fan Suction, and Fuel Gas Flow.

The system works so dependably that week-long kiln runs have been made without the operator touching anything.

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At Lone Star Cement Corporation, Bonner Springs (Kansas) plant, this Sly Dynaclone operates continuously to collect dust from all units in the crusher building. The salvaged material is automatically moved by screw conveyor from Dynaclone to storage. By keeping the building dust-free, the Dynaclone contributes to greater worker efficiency and reduced overall maintenance costs.

Three other Dynaclones at this plant also play a star role in cement saving. They reclaim cement dust from three silo groups and from the distribution systems that supply them.

Lone Star has nearly 200 Sly Dust Filter installations at its plants throughout the country. The reason: Sly Filters are designed to do a better job — with no appreciable maintenance — on all cement mill applications. Find out how they can do a better job for you . . .

NEW! "ROLL-CLEAN" DYNACLONE

Now, all the advantages of the original self-cleaning, continuously operating dust filter — *plus:*

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and magnesium sulphate methods.

"Deleterious" is a characteristic often considered in terms of aggregate shape, Dr. McGregor indicated, and there are excellent materials which have all required properties, but which when crushed tend to result in elongated fractions. It was suggested that the wide variance found in different potential aggregate materials would indicate that no single set of specifications should apply to all.

Members of the state highway department, including John Peters, chairman, spoke on maintenance materials, bidding, and construction. Mr. Peters stated that 1957 was the second largest highway construction year in the state's history. The program is gathering momentum, and it is expected that fiscal 1958 will require expenditures of more than $120,000,000, including both engineering and construction.

Kiln Ring Removal

(*From page* 154)

into the moving parts of the guns, causing wear and difficult operation. Gun manufacturers advocate blowing this dust out of the gun action before and after each use.

A better understanding of rotary kiln operators' problems and the recognition that clinker build-ups vary greatly in consistency, depth, thickness, and density have resulted in the manufacture and use of several types of industrial shells. The original Standard shells, having 7,500 foot-pounds of muzzle energy are still used on soft or spongy build-ups and on those up to 50 ft. from the hood in kilns under 130 ft. long.

The more recent Magnum shells have 9,000 foot-pounds of muzzle energy and are used on hard build-ups not over 50 ft. from the hood in short kilns and on hard build-ups in long kilns, regardless of their distance from the hood.

Both of these shells have 3-oz. solid lead slugs. Recently, industrial shells having approximately 2-oz. solid zinc slugs, have proved successful on clinker build-ups having a hard exterior with a softer mass inside. Zinc melts at 785 deg. F. whereas soft lead melts at 620 deg. F. Industrial shell slugs travel at over 1,000 m.p.h.

Enter 167 on card, page 239 →

Here's why more aglime producers turn to CEDARAPIDS...

- ✓ greater tonnages
- ✓ better quality product
- ✓ lower production costs

This Cedarapids-engineered Stationary Plant is producing seven different sizes of high-quality crushed limestone at a 150 ton per hour rate, with 90% crushing! A Cedarapids 4033 Hammermill occupies the key position, while a 4350 Double Impeller Impact Breaker handles the primary breaking and three 48″ x 12′ Horizontal Vibrating Screens grade the material to the specified sizes. That's the way one producer utilizes the high capacity, high efficiency of Cedarapids equipment to meet market demands for quality aglime with profitably low costs.

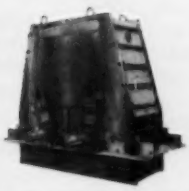
For more profitable aglime production, other producers all over the country depend on Cedarapids quality-built components, fully-engineered by Cedarapids crushing and screening experts into Stationary Plants that assure greater tonnages, better quality products, at lower production costs.

Cedarapids Hammermills produce higher quality aglime

A revolutionary operating principle combines an impact breaking action with a milling action, which results in the uniform, fine agricultural limestone that assures repeat orders. And size for size, Cedarapids Hammermills turn out more tons per hour than other similar types of equipment.

Cedarapids Hammermills, for producing aglime or crushed limestone, or both in one operation, are available in 4033, 3033, and 2033 sizes. You can have them in completely engineered Stationary Plants, as individual units, or in portable crushing and screening plants. Your Cedarapids dealer can tell you how to increase your profit from aglime production by using Cedarapids Hammermills and other equipment. Call him today.

CEDARAPIDS SERVES THE INDUSTRY WITH A COMPLETE LINE OF FINE EQUIPMENT



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ROLL CRUSHERS in 8 sizes with 3 types of roll shells insure high capacity of the smaller size finished products you want.

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HEAVY-DUTY FEEDERS designed to feed big crushers with a smooth, workable flow of material, and withstand the shock of heavy dumping.

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for limestone calcination

A second complete Dorrco FluoSolids System for the production of 100 tons of lime per day . . . an improved version of the existing installation . . . has recently been installed at the Adams, Massachusetts plant of the New England Lime Company. The original System, on stream since 1949 and the first to produce lime commercially by fluidization, is also producing 100 tpd of high quality lime and has firmly established the efficiency and economy of this new calcining method over more conventional methods.

The NELCO operation has conclusively proven that fluidized techniques offer many advantages over previous methods in meeting the prime requirements for calcining limestones . . . significantly . . . high thermal efficiency resulting in notable fuel economy and consistently uniform product of high quality due to closely controlled operating conditions.

Now, application of the same basic principles involved in limestone calcination is indicated in a wide variety of calcining problems. For example, Dorr-Oliver is at present supplying three new installations of multi-compartment units for the handling of a total of 1500 tons per day of western phosphate rock. And there's a good chance that the benefits to be derived from the high capacity-low calcining costs inherent in the Dorrco FluoSolids System may well fit into your plant operations, either existing or proposed.

The knowledge gained from world-wide applications of fluidized techniques plus complete research, development and pilot plant facilities are available . . . we welcome your inquiry. For complete information, write to Dorr-Oliver Incorporated, Stamford, Connecticut.

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"We're very well pleased with our Jeffrey Crusher"

reports South Dakota State Cement Company

42" x 82" Jeffrey Type B Reversible Impact Swing Hammer Crusher mill at South Dakota State Cement plant, Rapid City, South Dakota. Crusher is fed by 5' x 6' Jeffrey enclosed electric vibrating feeder.

350 to 400 tons of limestone per hour are reduced by this Jeffrey crusher to ¾" x 0" size. The chief engineer for this plant says they are well pleased with this crusher and its Jeffrey feeder.

This reversible swing hammer crusher is the outgrowth of many years of experience in reducing cement rock and limestone to a product suitable for tertiary or fine grinding mills. Jeffrey engineers designed it to produce the most efficient product size for operation at peak capacity, with minimum upkeep and power usage.

Bulletin 868 describes this crusher. For a copy, or for help in solving any reduction problem, write The Jeffrey Manufacturing Company, Columbus 16, Ohio.

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170

Dayton

(from page 132)

tained at about 2,300 deg., and are recorded by a Brown Radiamatic pyrometer.

Natural gas used in firing the kiln is introduced through a 5-in. burner pipe that is reduced to a 1½-in. orifice. This Hauck burner is housed in a 12-in. primary air jacket and has a 50,000 c.f.h. capacity. Primary air is provided by a 2,600 c.f.m. Bayley blower driven by a 15-hp. Allis-Chalmers motor. While performance figures have naturally been somewhat variable during the early operations, an average fuel consumption of 9,000,000 B.t.u. per ton of product has been experienced.

Owing to some fluctuations in the percentage of solids contained in the sludge discharged from the thickener, the rate of pumping from the agitating tanks to the expansion chamber and centrifuges is subject to variation. As a consequence, the kiln rotation speed is varied over a 4-speed range from ½ to 1 r.p.m.

At the discharge end, the kiln is fitted with Warner coolers—a series of cylinders 42 in. in diameter and 18 ft. in length, attached to and rotating with the kiln. Each houses a 21-turn screw and is mounted with its axis on a slight negative pitch to that of the kiln. Lime discharged from the kiln at 2,100 deg. F. passes through ports into the attached cylinders. At the opposite ends of the cooling cylinders are openings through which the cooled lime—at about 100 deg. F.—is dropped to a collecting screw. The same openings provide entry for the cooling air, which thus becomes preheated secondary combustion air.

As indicated earlier, the kiln exhaust gases pass first through an expansion chamber when they leave the kiln. They are then drawn through a 48-in. duct into an 8-ft. 6-in. by 24-ft. Peabody gas scrubber by a 22,000-c.f.m. Westinghouse induced draft fan. A set of four gas boosters installed in the kiln feed building (two 2,300- and two 900-c.f.m. units) are used to transfer scrubbed gas to the recarbonation basin noted previously. The remaining exhaust gases are discharged to atmosphere through a 30-ft. stack.

A totally enclosed room on one side of the firing floor houses the Allis-Chalmers master kiln control panel. Minneapolis-Honeywell and Hays instrumentation includes equipment drive ammeters; damper controls; revolution counter; hood draft, gas scrubber entrance and exhaust temperatures; O_2 analyzer; temperature indicator and recorder; and gas temperature, pressure, and flow recorders.

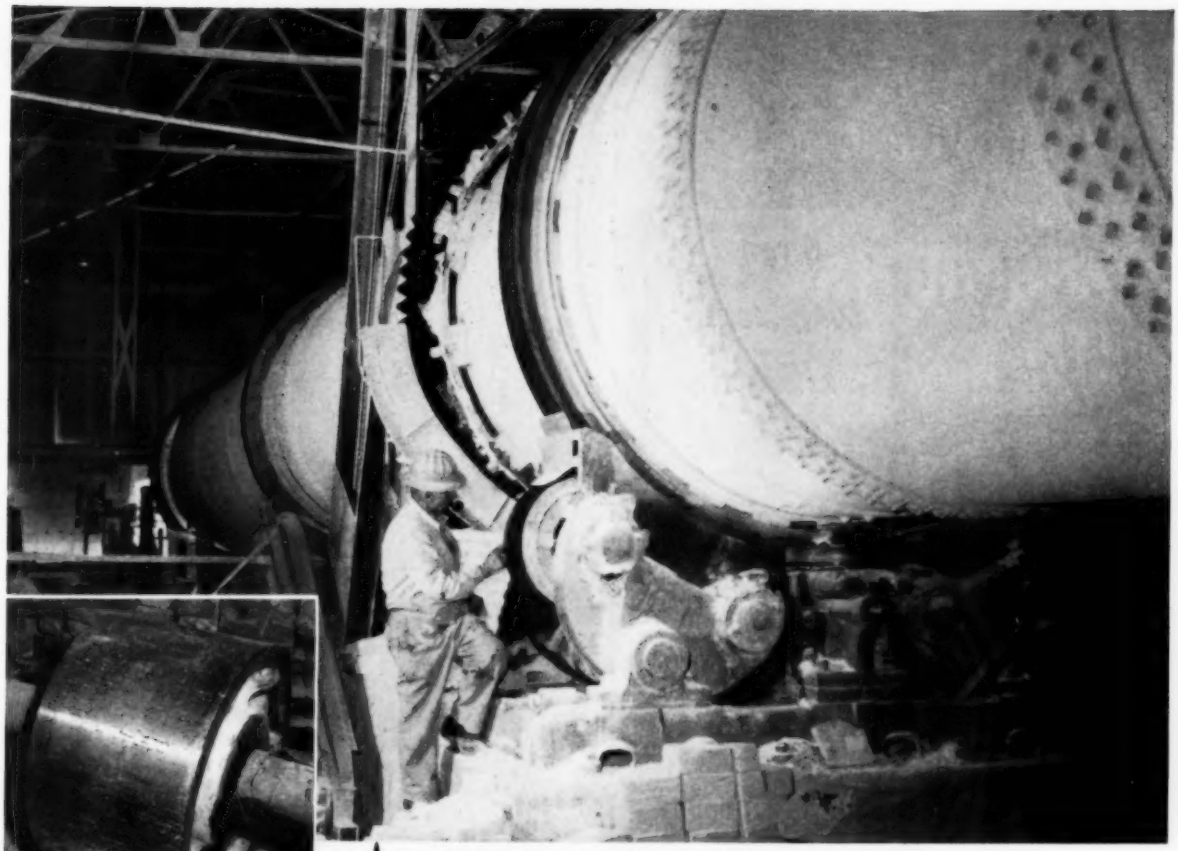
Lime Handling Finished product discharged from the cooling cylinders is received in a 12-in. Jeffrey screw conveyor. At hourly intervals, on all shifts, samples are pulled from this point for product check. The lime is transferred by the screw conveyor to the boot of an 80-ft. Jeffrey bucket elevator, and is then raised to discharge into a 672-ton capacity steel storage bin adjoining the firing building.

From this main storage bin, the lime is removed by a 10-t.p.h. Dracco Corporation pneumatic conveying system for transfer to the water treatment plant or to a sales bin. Air at about 3½ p.s.i. is provided for the pneumatic conveyor by a Roots-Connersville compressor. The 150-ton capacity sales bin is installed over a rail siding for bulk loading of hopper cars.

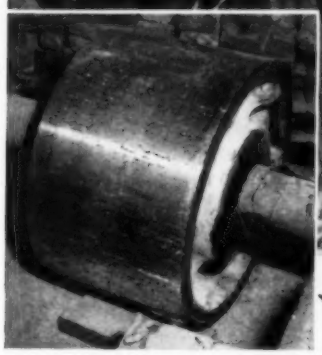
From the lime plant's present 100-t.p.d. output, an average of 55 tons is transfered to the water plant chemical building during a 24-hour period. The remainder represents excess lime for inventory or sale.

Three-shift operation of the new plant is handled by Ralph Taylor, supervisor of the kiln department, and a crew of 14 men. R. C. Stout is superintendent of Dayton's modern water treatment plant, of which the lime plant is the most recent development. Overall management of the water department is headed by W. T. Eiffert, city water director.

For the year ended December 31, 1957, Pennsylvania Glass Sand Corporation, Lewistown, Pa., reported a net income of $2,557,577, or $3.22 a share, compared with $2,621,821, or $3.29 the previous year. Net sales last year totaled $13,739,792, against $13,474,587 in 1956.



View showing relative size and position of furnace, rolls and rings.



Roll hardfaced with Victoralloy No. 1. After ten months of constant operation, no wear, flaking, or cracking of edges.

A case of wear and tear... and how Victoralloy solved it

PROBLEM:

The 300-ton furnace of Diamond Springs Lime Company, Diamond Springs, Calif., rolls on 16 centered 30/40 carbon steel rolls. The furnace's heavy weight and terrific heat caused the rolls to flake and crack at the edges. This in turn caused the furnace roller-rings to begin disintegrating. How to stop the wear and tear before an expensive shutdown and complete replacement of rolls and roller-rings became necessary?

SOLUTION:

Herbert Green, superintendent, and John Desson, general foreman, hardfaced the rolls with Victoralloy No. 1 Coated-Electric. Checking after ten months of operation, they found the case solved: no flaking of rolls, no cracking at the edges, and no disintegration of furnace roller-rings.

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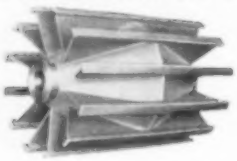

These pulleys provide six cost-cutting advantages — all-steel welded construction . . . lower cost . . . less weight . . . greater strength . . . greater resistance to breaking . . . longer life.

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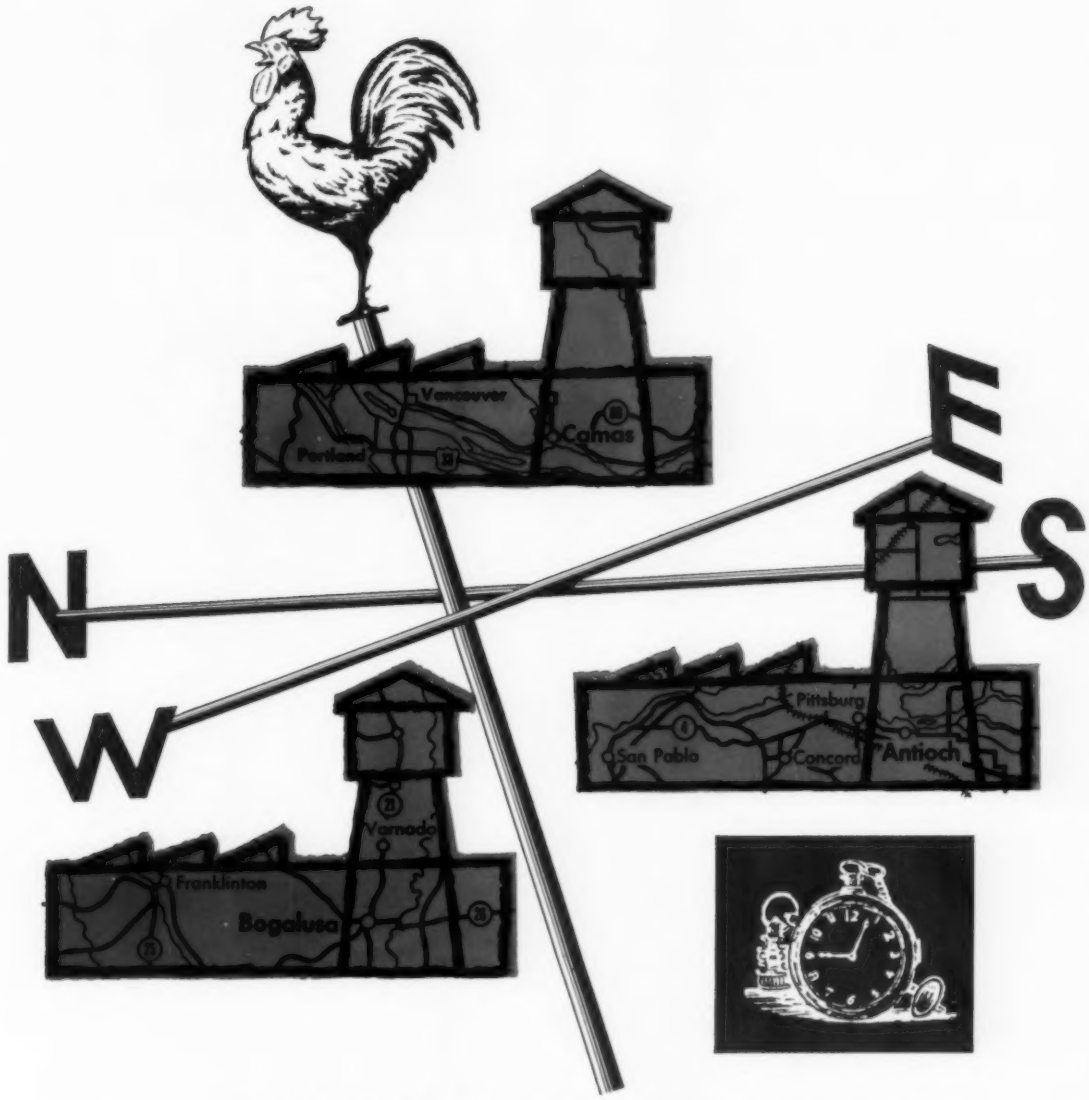

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This, in brief, is the heart of a successful logistics operation—whether you are furnishing supplies for troops . . . or Multiwalls for industry.

Part of the Crown Multiwall service is based on this principle—having Multiwalls *where* you need them, *when* you need them.

Our new Multiwall Bag plant in Bogalusa, Louisiana, which opened just last Fall is evidence we are translating this principle into reality. The Multiwall Bag plant at Antioch, California, with an annual capacity of over 60 million bags, which also opened just last year, is more evidence.

At present, Crown Multiwalls serve the entire nation—whether your plant is in Fort Flazoo, Florida . . . or Canipsee, California. You can depend on Crown Multiwalls, because Crown Zellerbach facilities are in the *right* place . . . at the *right* time . . . with the *right* bag.

Call Crown Multiwall for your packaging needs.

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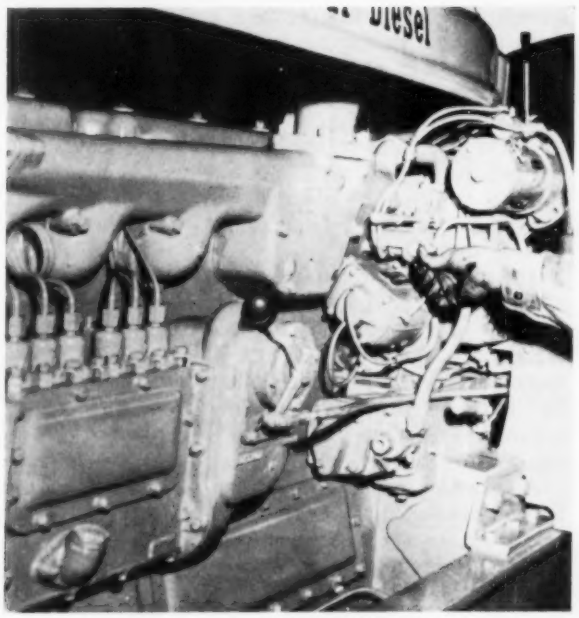

All-weather cranking power for diesel engines is often dependent on electrical power supplied by storage batteries; and even some gasoline starting engines are equipped with electric starting motors. It is therefore imperative that batteries be properly cared for.

Reliable Pushbutton Starting Depends upon Battery Care

By ROBERT H. HAWKINS
Manager, Central Division, Service Department, Caterpillar Tractor Co.

MACHINE owners have come to expect convenience and dependability when they start their diesel engines, regardless of temperature extremes. Some machines come equipped with gasoline starting engines, while others depend on electric motors for cranking the diesel. Even gasoline starting engines often have their own direct electric starting systems; in fact, most such electric systems are dependent on one source of power—the storage battery.

In cold or heat, rain or snow, dependable batteries are ready to supply the needed energy for cranking. Dependable, did we say? Yes, they are dependable, but if batteries are forgotten, neglected, or mistreated, they may fail at a most critical time.

A storage battery is a reservoir for storing energy which is used at a later time. Electrical energy is put into it or drawn from it, but the actual storage process is a matter of chemistry.

▲ ▲ ▲

All-weather starting of diesel-powered crawler tractors and other earthmoving equipment places heavy demands on storage batteries. Here are some maintenance tips on improving battery performance.

A storage battery has a limited capacity (the quantity of electricity which can be taken from it in a given period of time) just as a water storage tank can maintain a flow of so many gallons per minute for only a certain number of minutes. The capacity of a battery (sometimes called its electrical size) is usually listed in "ampere-hours." This term is used to specify the amount of current a battery will deliver continuously for a definite number of hours or minutes. Capacity depends on how well the battery is constructed, its age, the size of the plates, and the number of plates assembled in each cell.

Why do storage batteries run

down? Frequently the problem is the same as with any storage system: if more is taken out than is put back in, the reservoir for storage ultimately is empty. Added electrical load, such as lights, heaters, two-way radios, sometimes imposes a more severe drain on the system than can be replaced by the generator.

There are other reasons for failure. The first is age. After many hours of use the storage capacity is reduced. There may also be internal faults which continually drain off the electrical supply. Finally, improper maintenance and operation make a battery "age" quickly.

Any battery requires some attention for continued satisfactory service. Here are a few necessary rules for battery care:

Periodic Check A most important step in extending battery life is a periodic check of the electrolyte or water level. Nearly all storage batteries have a reserve space for water in the top above the plates, and most battery manufacturers recommend that water be added until it is ⅜ in. above the plates. Be careful not to overfill the battery; doing so allows the electrolyte to splash out and corrode all metal it contacts. Continued overfilling will result in so much loss of acid that the electrolyte may no longer be strong enough for the battery to deliver the required energy to crank the engine. If the battery requires water more often than once every two weeks, the charging rate is too high.

Cleanliness Counts Wash the battery occasionally with a "baking soda" solution (one pound of soda to one gallon of water) to neutralize the acid which is present on the case; then rinse it with a stream of cold water. Cleanliness also includes the terminals. Wire brush them until corrosion is removed, and then coat them with petroleum jelly.

Keep Battery Charged Maintain the battery in a normal state of charge—the specific gravity should be above 1.225—by keeping the generator output and voltage regulator in proper adjustment.

Never let a battery remain in a discharged condition for an extended period of time. The discharge action of a battery sulphates the plates, but this can be driven off if the battery is charged soon after discharge. However, if the battery is allowed to remain too long in a discharged condition, the sulphate becomes hard, and is very difficult, sometimes impossible, to drive the sulphate off the plates during charging.

Batteries have much longer service life if they are kept at or very near full charge at all times. In normal operation of equipment, some discharging and charging of the battery takes place continuously, but the battery is not discharged to a great extent at any time. However, cycling a battery (regularly discharging it almost completely and then recharging it) will seriously affect its service life.

Prevent Freezing In cold weather never add water at the end of a day's run. Instead, add water in the morning just before starting or right after starting. In this manner, the water will be thoroughly mixed with the acid by the end of the day's run and freezing of the electrolyte will be prevented.

Allow Rest Never use the electric starter more than 30 seconds at a time and then allow approximately 2 minutes between cranking cycles. The brief rest period allows the battery plates to cool and allows the battery to recuperate sufficiently again to deliver a surge of power.

After emergency use or accidental energy loss, such as leaving the lights on overnight, it might be necessary to quick charge the battery. No particular fault can be found with quick charging or hot charging methods, provided that the manufacturer's instructions are closely followed.

Storage Procedures Storage batteries which are not in use will lose their strength gradually (the rate of discharge depends upon the temperature) when left on the shelf or stored in machines for an extended period of time. The higher the temperature, the greater the loss of energy. To keep them up to strength and ready for use, recharge batteries in storage when their specific gravity drops to 1.240. A fully charged battery will show a hydrometer reading of 1.270 to 1.280.

Henrico Materials Corporation, a recently chartered firm, has purchased 468 acres of land in Richmond, Va., for $350,000. The land will be used for sand and gravel operations according to Miss Adair Wright, a director of the new company and secretary-treasurer of Commonwealth Sand and Gravel Corporation, Richmond. John Toohy II, president of Commonwealth, is also president of Henrico Materials.

Master-Jackson Paving Company purchased a 155-acre tract of land near Willard, Mo., for a quarrying operation, to be known as the Graystone Quarry Company. The property was purchased from Glen Gillespie and W. E. Gillespie.

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Here, the Armco conveyor tunnel is in operation and may be seen in the voids between the four aggregate piles.

Armco Pipe provides economical aggregate tunnel at California Quarry

In this photo, Armco Pipe for the Granite Rock Company is being assembled. Bolted coupling bands were used to join the 20-foot lengths of pipe.

"Armco Pipe gave us an economical aggregate tunnel," said owners of the Logan Quarry of the Granite Rock Company, Watsonville, California.

This grading plant required a tunnel to handle four separate aggregate piles. The mixed aggregate is gravity-fed to a continuous belt conveyor inside the pipe that extends to the unloading area.

A 96-inch-diameter Armco Corrugated Metal Pipe was selected for the job. Total length of the 8-gage pipe is 390 feet. Each aggregate pile over the Armco Pipe is about 25 feet high.

Armco Corrugated Metal Structures are also widely used for conveyor covers and drainage under access roads. The coupon below will bring you helpful, authoritative data on Armco Corrugated Metal Structures. Armco Drainage & Metal Products, Inc., 4998 Curtis Street, Middletown, Ohio. Subsidiary of Armco Steel Corporation.

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Bituminous Concrete Producers Meet in Las Vegas

By HARRY F. UTLEY

ANOTHER ON THE SPOT REPORT

OPERATORS engaged in preparing plant-mixed asphaltic concrete and those who lay down the product on the nation's streets, roads, and airfields, converged on glittering Las Vegas, Nev., from February 3 to 6 for the third annual convention of the National Bituminous Concrete Association.

One of the youngest of the national trade organizations—and one of the fastest growing—N.B.C.A. now boasts a membership of more than 500, and attendance at Las Vegas approximated that figure. The two previous annual meetings were held in Chicago.

Hundreds of aggregate producers operate asphalt-mixing plants and many are prominent in the affairs of the association; for example, members of the association's 1958 board of directors include the following: Lloyd S. Brannan (Brannan Sand & Gravel Co., Denver); Edward T. Perry (New Haven Trap Rock Co., New Haven, Conn.); Edgar Burkhardt (Massachusetts Broken Stone Co., Weston, Mass.); and Frank Longabaugh (Marble Cliff Quarries Co., Columbus, Ohio).

Convention headquarters and meeting sessions were in the fabulous Flamingo Hotel. On the social side, it was pretty much do as one pleased, the plush gambling casinos vying with theatre-restaurants on the "strip" as attractions. Few of the delegates missed seeing such headline attractions as Jimmy Durante, Sophie Tucker, Jerry Lewis, Marlene Dietrich, and Ginger Rogers, who were appearing in person during the convention week.

Since asphaltic concrete's economy depends almost entirely on road-building activity, the primary concern during the four-day meeting revolved around the nation's

Delegates and guests of the National Bituminous Concrete Association gathered in the Flamingo Hotel for their annual banquet and floor show during the third annual convention of the association in Las Vegas, Nev.

41,000-mile interstate highway-construction program. Numerous facets of this program were spotlighted by various speakers.

The talk which probably evoked the most comment during the convention was that presented by H. E. Bailey, Oklahoma City consulting engineer, who offered some practical and constructive ideas for speeding up the program which could enable most of those now living to drive over these planned superroads from border to border and coast to coast.

The Bailey plan is predicated largely on revenue-bond financing as exemplified by the toll-road turnpikes for speedy accomplishment of the program, in contrast to what he termed the painfully slow and often wasteful tax financed, pay-as-you-go scheme.

"We started out 20 years ago, "Mr. Bailey recalled," by proposing a 14,000-mile system which would require 6 years to build at a cost averaging $202,000 per mile. In the next ten years—with almost nothing accomplished—we increased the system to 40,000 miles at a cost of $281,650 per mile. In 1956, with still very little accomplished, the system was increased to 41,000 miles costing around $700,000 per mile. Now, in 1958, we are faced with a 41,000-mile system costing $1,136,500 per mile, which may take 24 or 25 years to build!"

Mr. Bailey believes the construction and financing record of the turnpikes points a way for solving the problem and permitting the system to be built in the relatively short period of 10 or 12 years. His hope is that Congress will not again reject the principle of revenue-bond financing. If it does, the only possible alternative to prevent the bogging down of the program will be the adoption of an apportionment formula and a priority schedule that will not penalize the progressive states as, he declared, it now does.

Others who spoke on the interstate road program included W. E. Willey, Arizona state-highway engineer, and H. A. Radzikowski, development chief of the U. S. Bureau of Public Roads.

An entire afternoon was taken up with a most informative panel discussion on equipment, both as it exists today and as it is planned for the future. Various aspects of hot-plant operation discussed included the screening of aggregates, bitumen heating, proportioning and mixing, and lay-down procedures involving paving machines and compaction equipment. Equipment manufacturers appearing as panel members and participating in the discussions included: Barber-Greene Co.; Hetherington & Berner; Iowa Mfg. Co.; Madsen Division, Baldwin-Lima-Hamilton Corp.; Pioneer Engineering; Simplicity System Co.; and Standard Steel Corp. Following the presentation of these firms, other machinery makers were invited to places on the platform to augment the panel.

John W. Kelly, Imperial Paving Co., Oklahoma City, was elected president to succeed Sheldon G. Hayes, Cadillac Asphalt Paving Co., Detroit. Mr. Hayes had been at the helm of N.B.C.A. ever since the association was organized in 1955.

John W. Kelly, Imperial Paving Co., Oklahoma City, Okla., new N.B.C.A. president, with J. Rogers Martin, engineer-manager, Hot Mix Asphaltic Concrete Association of Oklahoma, at the third annual N.B.C.A. convention in Las Vegas.

One of the final actions taken at the Las Vegas meeting was to create an international division of membership as a result of requests from firms and individuals in all parts of the world who have sought to join the association. Heretofore membership had been limited to the United States and its possessions.

The 1959 convention will be held in Miami, Fla., the dates and location to be announced soon.

Association headquarters are maintained at 1145 Nineteenth St., N. W., in Washington, D. C. H. K. Griffith is executive director.

Powdered Superphosphate To Be Made at Davison Plant

The Davison Chemical Company, Baltimore, Md., a division of W. R. Grace and Company, has installed facilities costing $1,500,000 at its triple superphosphate plant in Bartow, Fla. The new equipment will enable the plant to produce run-of-pile triple superphosphate in powder form in addition to the granulated material previously turned out.

The additional process does not raise the plant's overall triple superphosphate production total, originally rated at approximately 200,000 tons annually, a figure which has been considerably exceeded in operation.

Output to be Increased 45% At Kosmos Portland Cement

The Flintkote Company, East Rutherford, N. J., plans to expand production of its Kosmos Portland Cement Company subsidiary in Kosmosdale, Ky., by 45 percent, increasing rated annual capacity from 2,200,000 bbl. to 3,200,000 bbl.

The expansion is scheduled to be completed by mid-1959. Flintkote acquired Kosmos Portland Cement last August.

The Internal Revenue Service has recently reissued a summary of rules governing depreciation. Pointers on how businessmen should handle salvage value and other items which were brought about by the 1954 tax code are included. Copies of I.R.S. Publication 311 may be obtained for 20 cents per copy from the Government Printing Office, Washington 25, D. C.

sintering practices, applications discussed at meeting of

Expanded Clay, Shale Assn.

Officers re-elected at the meeting of the Expanded Clay and Shale Association include (left to right): L. E. Pfeiffenberger, technical director; D. M. Groves, secretary-treasurer; R. G. Hardy, vice-president; R. A. Utiger, president; and T. R. Berger, executive secretary.

ANOTHER ON THE SPOT REPORT

THE annual meeting of the Expanded Clay and Shale Association, held February 14-15, 1958, at the Conrad Hilton Hotel, Chicago, Ill., was attended by about 40 representatives and guests of the member companies. All officers of the association were re-elected for 1958. These included: R. A. Utiger (Cinder Products, Inc., Denver, Colo.), president; R. G. Hardy (Onondaga Brick Corporation, Warners, N. Y.), vice-president; and D. M. Groves (Shalite Corporation, Knoxville, Tenn.), secretary-treasurer. T. R. Berger, Allentown, Pa., continues in his work as executive secretary.

The meeting featured a number of interesting papers relating to manufacturing methods and end product uses for expanded-clay and shale lightweight aggregates. In his annual report to the membership, Mr. Berger stated that the association is now embarked on a program to meet the need for more and better technical information. As evidence of this fact, he cited the broadbased program of research now being financed by the association and carried out at the Besser Company laboratories, Alpena, Mich. He presented to the members the first edition of a new publication, *Lightweight News,* which will be issued every four months to members and others interested in the industry. Mr. Berger predicted that this year will be an important one for expanded-clay and shale aggregates, and forecast a pickup in tonnage shipped after the turndown in volume during the last quarter of 1957 and the first few months of the current year.

L. E. Pfeiffenberger, technical director of the association, presented a paper, *Firing Behavior of Clays for the Production of Lightweight Aggregate by the Moving Grate Process,* which was a summary of raw materials used by 12 commercial sintering plants throughout the country which he inspected during the summer of 1956. The investigation was divided into three parts: plant visits, laboratory study, and air-flow performance at a single plant. An interpretation of cellular formation and aggregate characteristics was drawn from the comparison of plant inspection and laboratory studies. A placement of the charge on the sintering hearth is proposed, to produce a more efficient operation.

At these plants Mr. Pfeiffenberger used an anemometer to check the air flow through the bed for the full length of travel. It was found that air leakage at the edges of the grate is a common problem and that slanted sides appear to be a partial answer. In many plants there was underburning at the center of the grate; a swinging spout was used, and when it was vertical at the center of the bed, the material dropped unhindered and compacted on the grate. One producer uses a spiked wheel to provide for air passage, but the holes so formed are too large. Plows were also found unsatisfactory. It appears, the speaker said, that the real solution to this problem is proper distribution of the material on the grate.

Ronald G. Hardy, general manager, Onondaga Brick Corporation, Warners, N. Y., presented a progress report on a valuation program being conducted by that company. In this project, eight major components were reviewed. These included raw material, fuels, re-runs, mixing water, air, ignition, grate travel, and placement of material on grates. The paper evoked considerable discussion on these items.

In tests conducted at this plant it was found helpful to use a coke breaker and a screen at the discharge end of the Dwight Lloyd grate. The lower part of the coke can then also be seen to determine whether it is properly burned. There is, said Mr. Hardy, a best size of material for most efficient sintering in every plant. In his it is¼-in. top size. A 12 percent moisture content is used.

B. K. Powers, general manager, Virginia Lightweight Aggregate Corporation, Charlottesville, Va., chairman of a special committee of the association formed to study plant operating problems, reviewed dust and noise control methods and operational and maintenance problems in typical sintering plants producing lightweight aggregates. Producers answering a questionnaire stated that they used water sprays and quenching pits in processing, and light sprays on stockpiling and loading conveyors to control dust. In his experience water never has done the full job. At the speaker's plant all of the sintering machinery is in a building, and a combination of settling chambers and cyclones is being installed.

Control of noise about a plant was also discussed. In one case a noisy high-speed fan was replaced with an 865-r.p.m. fan which was much quieter.

Most producers answering the questionnaire use ordinary rubber belt conveyors, except for hot material just off the grate. There apron conveyors or special hot material belts are used. One producer uses a 15-ft. apron conveyor, followed by a rubber belt with sprays. For protection against dust, the bearings are lubricated daily.

R. C. Johnson, Simplicity Engineering Company, Durand, Mich., described a centrifugal-action crusher developed by that company for the gravel industry, which produces a separation of the soft materials from the hard gravel. Preliminary tests on lightweight aggregates indicate that the application of this type of machine may be an answer in overcoming the high maintenance cost of crushing clinker.

William W. Karl, sales manager, Lehigh Materials Company, Tamaqua, Pa., presented an analytical report on the significant growth in the use of expanded-shale and clay aggregates in the important structural concrete fields. He discussed the need for authoritative technical data in this area of potential growth, as well as the advantages of lightweight aggregates for multi-story construction and related structural uses.

Ben A. Batson, president, Shalite Corporation, Knoxville, Tenn., presented a review of research on pavement slipperiness now being conducted by the Department of Highways and Public Works at the University of Tennessee. In these tests, trial batches of lightweight aggregate concrete are being tested on a laboratory specimen 36 in. square by 6 in. deep. A progress report will be submitted later this year.

The role played by lightweight aggregates in the construction of the suspension portion of the $100,000,000 bridge over the Straits of Mackinac in Michigan, was described in a paper illustrated with slides, by Melvin Cruzen, general manager, Lightweight Aggregate Corporation, Livonia, Mich. Joseph J. Shideler, manager, products and applications development section, Portland Cement Association, Chicago, Ill., presented a paper which discussed the structural properties of lightweight aggregate concretes in a strength range of 3,000-5,000 p.s.i. The data included compressive and flexural strengths, elastic properties, bond, creep, and drying shrinkages of concretes containing seven lightweight aggregates and one sand and gravel aggregate. The discussion also included proportioning of the mixes and procedures required to insure proportioning control on the job.

Two new producer-members were admitted to the association during 1957—Sayre & Fisher Company, Sayreville, N. J., and North Central Lightweight Aggregate Company, Minneapolis, Minn., both Aglite aggregates producers. R. Frank Leftwich and William D. Heney of these companies, respectively, were seated as members of the board of directors. The mid-year meeting of the association will be held July 21-22 at the Cosmopolitan Hotel, Denver, Colo.

Jan. Lime Sales Improve Over Total for December

Domestic sales of open-market lime in January (630,033 short tons) increased over the previous month's output, according to reports by producers to the U. S. Bureau of Mines. Building, chemical and industrial uses increased; agricultural and refractory lime declined.

Lime Sold by Producers[1] in the United States, in Specified Periods of 1957-58, by Types and Major Uses in Short Tons

	November 1957	December 1957	January 1958	January 1957
By types:				
Quicklime	550,933	503,154	485,768	640,567
Hydrated lime	139,557	121,072	144,265	126,253
Total lime[2]	690,490	624,226	630,033	766,820
By uses:				
Agricultural:				
Quicklime	11,624	6,093	2,002	900
Hydrated lime	6,787	4,091	5,267	5,918
Total	18,411	10,184	7,269	6,818
Building:				
Quicklime	12,433	8,183	10,871	10,200
Hydrated lime	68,675	52,108	72,987	56,502
Total	81,108	60,291	83,858	66,702
Chemical and other industrial:				
Quicklime	355,544	340,377	342,337	403,033
Hydrated lime	64,095	64,873	66,011	63,833
Total	419,639	405,250	408,348	466,866
Refractory (dead-burned dolomite)	171,332	148,501	130,558	226,434

[1] Also includes a small quantity of captive tonnage. The monthly canvass excludes the output of plants producing less than 10,000 tons a year.
[2] Approximately 60 percent of lime produced is high-calcium and 40 percent high magnesium.

Maker of Century Maroon Praises Cities Service Green!

"16 Trouble-Free Years with Cities Service Lubricants!"

You've doubtless heard of Century Maroon, Century Pink and Century Tweed.

These are famous colors of granite made into memorials by Century Granite Company, Snyder, Oklahoma.

But if you talk to the people at Century, they'll tell you there's another color that's mighty popular in their operation—Cities Service Green.

Here are some reasons: Cities Service Trojan M-3 Grease, with its natural affinity for water and ability to withstand high temperatures, has proved the ideal lubricant for gang saws. Similarly, jack-hammers and other equipment subject to even more water get the protection they need from Cities Service Neptune 2-Z. The unusual and exacting physical characteristics of this lubricant plus the outstanding emulsifying properties have provided years of trouble-free operation.

"That's the kind of performance we've been getting from all Cities Service products for the past 16 years," reports partner George Verhoff. "Thanks to their protection, our equipment requires minimum maintenance."

Wherever production schedules are tight and profit margins tighter—that's the place for Cities Service fuels and lubricants. Proven moneysavers, these superior products can brighten your maintenance picture, too.

Get the facts from a Cities Service Lubrication Engineer. Or write: Cities Service Oil Company, Sixty Wall Tower, New York 5, N. Y.

CITIES SERVICE

QUALITY PETROLEUM PRODUCTS

Gang Saws are lubricated by Cities Service Trojan M-3 Grease, a lubricant specially fortified to withstand heat and water.

90% Of Century's Granite is used for memorials which are distinguished by their famous colors: Century Pink, Century Maroon, and Century Tweed.

Check up on

√ Your Safety Score

By JACK E. BEDFORD
Professor of Management
Armstrong College
Berkeley, Calif.

PLANT safety, like the weather, is a ready subject of conversation when any group of management-minded men meet. But, unlike the weather, plant safety can be improved—and is being improved—as a result of these conversations.

Labor turnover, increased training costs, extra production expense, and lost unit production are a few of the losses a plant suffers when an accident occurs. The employee suffers the physical pain, the lost hours, and the medical expense; and he may develop a fear of returning to work.

Figures on an industry-wide basis reveal that *more than 380 million production days* were lost during the last year because of industrial accidents—an average of 8 days lost for each worker. Thus, a plant employing 50 workers will lose an average of 400 days of production time during the year through accidents.

These figures indicate a need for implementing safety slogans. Use the following check list to rate the adequacy of your present accident prevention program, or as a guide in setting up a new program.

Check each statement that you can honestly answer with an unqualified *yes*. The total number of checks will indicate your plant safety score.

ORGANIZATION

1. ___Has top management been completely sold on the value of a safety program? (Unless this question can be answered *yes* in resounding tones, the balance of these questions will have little value in reducing the accident rate in your plant.)
2. ___Does the safety program have the complete co-operation of the middle-management staff in your plant?
3. ___Has your safety program been integrated as a definite part of the plant production activity?
4. ___Have you appointed a safety director or selected a safety committee to handle the details of the safety program? (Both of these plans are considered in the following sections of this check list.)
5. ___Is the safety program set up so there is an easy flow of communications both up and down the organization channels?
6. ___Are top level conferences regularly scheduled to consider the progress of the safety program in your plant?

Ideal Cement Mixer

SAFETY DIRECTOR

Most plants have either a safety director or a safety committee to help maintain a low accident rate.

If your plant has a safety director, you will want to consider these questions: (A safety committee is considered in the next session.)

1. ___Have you selected one person (full or part-time) to handle the work of the safety director?
2. ___Has this safety director been given the authority to direct and co-ordinate the safety program?
3. ___Is the safety director responsible for the success of your plant's safety program?
4. ___Does the safety director know

the men in the shop and understand their problems?

5. Is the safety director willing to delegate authority and responsibility for the various phases of the safety program?
6. Is the safety director able to contact and deal with the workers in a helpful and satisfactory manner?
7. Do you take quick action on the recommendations of your safety director?

SAFETY COMMITTEE

If you have to set up a safety committee in your plant, you will want to check the following questions carefully about your committee and its activities:

1. Is the safety committee composed of both workers and supervisors?
2. Is there some plan for adding new people to your safety committee periodically?
3. Does your safety committee determine standards for safeguarding equipment and machinery?
4. Does the safety committee formulate and check on the observance of safety rules in the plant?
5. Does the safety committtee investigate all accidents and make recommendations for the elimination of the hazard?
6. Does the safety committee review safety suggestions and pass on their practical application?
7. Do you take action on the recommendations made by your safety committee?

SAFETY TRAINING

1. Have all workers in the plant been informed of what accidents mean to them, both physically and financially?
2. Do the employees understand the cost of accidents to the plant and how this effects their earnings and security?
3. Have the employees been instructed in the safe way to perform their assignments?
4. After the initial safety instruction, are the employees asked to perform their tasks in the safe way?
5. While the employee is performing the task in training, does the trainer (safety director or foreman) check to be sure it is completed safely?
6. Have you set up some system of periodic checkup on the safety training on a departmental level?
7. Are the workers encouraged to make suggestions for ways and means of preventing accidents in their departments?
8. Are regular conferences on safety conducted on the departmental level?

SAFETY REPORTS

1. Do you have a system of safety reports that keeps you up-to-date on the safety status of your plant?
2. Do you require a periodic report from each supervisor describing conditions in his department which need safeguarding to avoid future accidents?
3. Do you follow up safety reports with inspection tours to check on all danger spots reported?
4. Does the supervisor who reports these unsafe conditions accompany you on this tour of inspection?
5. Do you correct the most serious conditions reported on the safety reports first, even though they require a larger expenditure?

ACCIDENT REPORTS

1. Do you receive an accident report every time there is an accident in your plant?
2. Do your accident reports pinpoint the location in the plant where the accident occurred?
3. Do your accident reports indicate whether one group of employees (age, sex, etc.) has more accidents than another?
4. Do your accident reports indicate which shift has the largest percentage of accidents?
5. Do you know the cause of the largest percentage of your plant's accidents?
6. Have you made an accident report analysis for the last three or four years to determine a pattern of accidents?

SAFETY STIMULATION

1. Have you held a safety contest or safety drawing within the last year?
2. Are employees with good safety records given some type of reward?
3. Are signs, posters, and slogans used to keep your employees conscious of safety at all times?
4. Do you give local publicity to your plant's safety program and record?
5. Is individual safety performance given recognition on your bulletin boards or in your company magazine?
6. Have you considered a program of promoting home safety for its carry-through value?
7. Have you considered a program of personal letters to employees who have worked without an accident for certain periods of time?

SAFETY EQUIPMENT

1. When considering new plant equipment, do you always consider the safety factors before making a decision?
2. When making any change in production, do you investigate the danger of accidents with this change?
3. Do you provide your employees with the latest in personal safety equipment for their jobs?
4. Do you check each issue of your business magazine for the latest ideas in safer equipment and supplies?

Vulcan Materials Company, Birmingham, Ala., which recently acquired Union Chemical and Materials Corp., and Lambert Bros., Inc., by merger, several other companies by acquisition of capital shares, reported 1957 consolidated sales of $90,602,000 and consolidated net income after taxes of $5,778,000.

The Minnesota Mining and Manufacturing Company, St. Paul, Minn., detonated 500 tons of high explosives at its mountainside quarry near Corona, Calif. The blast cut back 200 ft. into the hillside and provided a three-year supply of rock.

Overall view of the Kendrick quarry of Ocala Lime Rock Corporation shows limestone face, loading area, haul road, and dump area. The Kendrick quarry, under the supervision of L. W. Fielding, produces about 400,000 tons of crushed limestone for highway use yearly.

Ripping Stone Pays Off For Florida Lime Producer

With the ripper teeth penetrating to a depth of 16 in., a tractor rips limestone at the Kendrick, Fla., quarry of the Ocala Lime Rock Corporation.

COMBINING a tractor-mounted ripper and a bulldozer blade into a primary production tool has resulted in definite cost reduction and capacity increase for a Florida producer of high-calcium crushed limestone. The Ocala Lime Rock Corporation operates two pits —one, a 25-acre quarry at Kendrick, Fla., about 6 miles from Ocala. The Kendrick pit produces crushed stone for state and private highway builders in the area. A part of the Ocala limestone formation, the deposit varies in depth from 40 to 60 ft. above ground water level. Calcium content of the moderately soft stone is high, reaching 99 percent in some cases.

Originally, the firm used conventional drilling and blasting methods to loosen the deposits for loading, but several years ago a switch was made to a tractor-towed ripper as a low-cost replacement for the blasting powder. This method is widely

6 YARDS

A ten or twelve yard tandem-axle truck loaded in 60 seconds!

***Two* 23-ton semis heaped in three or four minutes!**

***Two* passes for the smaller truck, five for the two bigger ones *combined*.**

Someone's dream? Not any more! It's been standard practice at Stony Creek Stone Company's pit near Indianapolis ever since last summer. That's when their big *6 yard* Model 375A Michigan Tractor Shovel went to work.

Big production cuts costs, reduces truck waiting time

Stony Creek's problem up until then had been a common one: "How to hold down loading costs, and reduce truck waiting time in the face of rapidly-expanding customer demands." Fast rubber-tired Tractor Shovels had long since replaced cranes and crawler-loaders. The biggest rubber-tired units available, 2¼ yds, were in use. But, production requirements were calling for still more loading capacity. At that point, Company General Manager Dick Irving got a big idea. Visiting the Clark booth at the Road Show, he saw the new 6 yard Model 375A Michigan. "There," he thought, "is a Tractor Shovel that could *really* do a job for us It could give us enough capacity to replace two smaller Tractor Shovels *plus* handle all the expansion we anticipate for years to come."

Michigan output totals 2,500 tons daily

Today, the big Michigan and its *one* operator do the work of two or more smaller Tractor Shovels. Michigan output averages 2,500 to 3,000 tons of crushed limestone every day. "Despite its size, I'd rather run this big Tractor Shovel than any other," says Operator Carroll White. "It handles easily. It moves and responds just as fast as any smaller loader. Its big low-pressure tires really absorb the bumps. And its smooth ride sure cuts down on the fatigue you'd expect from a 10-hour day—even though I alone load as much stone as two men

Notice how much this big new Michigan *looks* like the smaller Michigans you see everywhere. It handles as easily as they do, too—with power steer, power-shift, torque converter, planetary wheel drive-axles standard. Its entire all-Clark power train is the same design as that job-proved in the 8,000 Michigans now in the field.

Specifications	Model 375A	Model 275A
Bucket capacity (standard SAE ratings)	6 yards	4 yards
Lifting capacity	30,000 lbs.	22,000 lbs.
Weight	61,000 lbs.	45,000 lbs.
Speeds (forward and reverse)	0-25 mph	0-28 mph

PER PASS

did when the pair of 2¼ yard rubber-tired Tractor Shovels were working."

Five passes heap two semis

And that's another reason White prefers the 375A. Higher production! With the smaller machine, White needed at least four minutes and eight passes to load one 23-ton haul truck. With the Model 375A, White regularly loads *two* 23-ton semis in the same time or less—in only 2½ passes each. Two-and-a-half passes? Yes, White does it like this: Two heaped loads go into the truck. On the third load, precise hydraulic controls let White hold bucket so that only half its load is dumped. That fills one truck. The other half-load is fed into the second truck. Then, two more full loads sends this truck on its way too. Thus: five passes, two truck-loads.

Efficiently loads small trucks, too

White even prefers to load a *five-yard truck* with the 6-yard Michigan. Here, the Tractor Shovel bucket is allowed to extend beyond the back end of the truck when dumping. May *sound* wasteful, but before the loaded truck can shift into second, one quick swipe of the Model 375A bucket has cleaned all spillage.

Model 375A easy to maintain

White feels the big Model 375A is as easy to run as *any* Michigan Tractor Shovel—perhaps even a little easier because of its greater weight and better stability. The new Tractor Shovel is easy to take care of, too. In only 10 minutes each morning, White makes his daily maintenance check. Proper care, plus rugged construction, have held repairs to virtually nothing. In the many months Stony Creek has had the Model 375A, there has been *no maintenance at all* on the job-proved Clark power train.

Clark distributors are ready to *show you* this big new dependable 6 yard Michigan, as well as the new almost-as-big 4 yard Model 275A. Call to arrange a date.

Michigan is a registered trade-mark of

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In Canada: Canadian Clark, Ltd., St. Thomas, Ontario

CLARK® EQUIPMENT

Enter 186 on card, page 239

Ripped limestone is dozed across the deposit and over the face to the floor below by the tractor. On the floor, shovels load it into trucks for a haul to the crusher.

used in the comparatively soft deposits found throughout Florida. With the introduction of the towed ripper, daily production was boosted, while cost per ton dropped. Recently, a tractor-mounted Caterpillar No. 8 ripper was brought into the quarry to replace the towed unit, and again production climbed, this time almost 50 percent, while costs decreased.

In actual production of the crushed limestone, Ocala uses a Cat D13000-powered Bucyrus-Erie 38B dragline and Caterpillar D8 tractors with bulldozers to strip about 10 ft. of clay overburden from the top of the deposit. After the overburden has been completely removed, a D8 with ripper and U-shaped bulldozer blade begins the job of breaking the stone for loading. The dragline, converted to a clamshell crane, is also used to clean out clay pockets in the deposit.

Beginning at the top of the deposit, the D8 strips a layer at a time, until the floor of the quarry is reached. The operator makes from two to four series of passes through the soft stone with the ripper teeth at a depth of from 14 to 16 in. At least one series is made lengthwise and one across the width of the layer, the number depending on the hardness of the strata.

When the ripper has broken the material into chunks of usable size, the tractor operator raises the teeth and brings the U-blade into action. Broken stone is dozed across the top of the deposit and over the face to the floor below in a continuing operation until the top is clean. Then, ripping begins again. Because the U-blade can handle larger quantities of material than a regular straight bulldozer, the company has realized a dozer production increase of around 20 percent.

On the floor at the foot of the face, two Cat D13000-powered Bucyrus-Erie 38B shovels scoop up the limestone and load it into 4-cu. yd. Dodge dump trucks. A working pile is maintained by another Cat D8 Tractor which cleans up around the shovels.

At the end of a 300-yd. haul the trucks empty through a hopper into two cable-operated rail skips which lift the stone about 80 ft. to the crushing plant. There, a 54-in. McLanahan electric-powered crusher reduces the chunks to a 3½-in. maximum for use in road work by the state highway department. A 1½-in. maximum size is also produced for certain requirements by a Cedarapids hammermill. Ocala ships most of its product in 50-ton rail cars from a spur near the crusher.

When the tractor-ripper has worked down to the level of the quarry floor, the machine is moved back to the top of the deposit, and a new cycle is started. After the digging operation has reached about 60 ft., ground water flow begins to be a problem. At present the quarry floor lies above the water level, but when it becomes necessary to mine the stone below water level, a Northwest Model 95 dragline will be used to dig to an additional 40-ft. depth.

L. W. Fielding is the superintendent at the Kendrick operations and Donald E. Rose is assistant superintendent.

The Warner Company, Philadelphia, Pa., reported a net income of $1,707,525, or $3.17 per common share, for the year ended December 31, 1957, against $2,347,469, or $4.74 a share in 1956. Net sales last year totaled $23,897,544, compared with the previous year's $26,086,708.

Cassiar Asbestos Corporation, Canada, reported a net profit of $2,811,295 equal to 74 cents a share in the year ended September 30, 1957, an increase of over 25 percent from net profit of $2,225,088 equal to 59 cents a share in 1956. Sales totaled $8,314,620 in 1957; $6,854,319 the previous year.

Gypsum, Lime and Alabastine, Canada, Ltd., Toronto, Ont., reported a net income (after taxes) of $2,069,707 or $2.35 a share for 1957 as against $2.34 per share in 1956.

Consolidated 1957 sales of $370,106,838, an increase of 12 percent over the 1956 volume of $330,807,692, were reported by Minnesota Mining & Manufacturing Co., St. Paul, Minn. Earnings on the common stock last year were $39,446,558, or $2.34 a share, compared with $38,437,684, or $2.30 a share, for 1956.

Bestwall Gypsum Company, Ardmore, Pa., earned a net income of $3,072,566 or $4.17 a share in the year ended December 31, 1957, compared with $3,733,599 or $5.07 in 1956. Net sales in 1957 totaled $29,401,797; in 1956 sales amounted to $31,588,457.

Industry Personalities

WILLIAM J. YOUNG has been elected vice-president of administration, and R. WILLIAM ROSE was chosen vice-president of finance, both offices newly-created by the Lehigh Portland Cement Company, Allentown, Pa.

Mr. Young will be in charge of the administrative division, which was created to achieve closer coordination and co-operation between staff functions and to serve as liaison between the staff and the principle departments, manufacturing and sales.

Mr. Rose has served as controller since 1954, when he joined the firm.

The National Gypsum Company, Buffalo, N. Y., has announced three managerial appointments.

DAVID G. STENBERG has been named sales manager of pre-fabricated goods. With the company since 1939, he held the position of Central Division sales manager for the last four years.

Succeeding Mr. Stenberg is WILLIAM W. GERBER, who was previously manager of the Buffalo sales district.

Taking over Mr. Gerber's position will be JOHN C. BERLIN, former assistant manager of Buffalo sales.

GUS J. CHAVALAS has been promoted to director of labor relations by the Permanente Cement Company, Oakland, Calif. He will also direct labor relations of the northern California plants of Kaiser Aluminum and Chemical Company, Oakland.

FREDERICK H. LAWSON succeeds Mr. Chavalas as superintendent of industrial relations. He was formely industrial relations superintendent at the company's Moss Landing plants.

JOSEPH P. GIBBONS has joined the Alpha Portland Cement Company, Easton, Pa., as a sales representative in northeast Pennsylvania, with headquarters in Scranton. His territory will include Bradford, Carbon, Lackawanna, Luzerne, Monroe, Pike, Sullivan, Susquehanna, Wayne and Wyoming counties. For the last 13 years Mr. Gibbons had been general manager of the Scranton Builders Supply Company.

D. C. Honey

DAVID C. HONEY has been elected vice-president for manufacturing by the Riverside Cement Company, San Francisco, Calif. He will be in charge of the company's cement manufacturing operations at the Riverside and Oro Grande plants in southern California.

Mr. Honey joined the company in 1954 and has held the position of assistant to the president since March, 1957.

J. H. Lavery

JOSEPH H. LAVERY has been appointed sales representative for South Carolina by the Carolina Solite Corporation, a subsidiary of Southern Lightweight Aggregate Corporation, Richmond, Va. He will be headquartered in Charlotte, N.C.

GORDON K. RAY has been appointed manager of the Highways and Municipal Bureau of the Portland Cement ssociation effective March 1. He succeeds LEO M. ARMS, who has been named technical adviser of the Highways and Municipal Bureau.

SAM MARTIN was named works manager at the Pilot Rock plant, of the United States Gypsum Company at Pendleton, Oreg. He has been an employee of the company for nine years.

(*Continued on page 192*)

Missouri Limestone Group Holds Annual Convention

The 13th annual convention of the Missouri Limestone Producers Association, held March 24-25 at the Hotel Governor, Jefferson City, Mo., was reported to be one of the most successful in the history of the group. More than 170 producer members, associates, and guests attended the meeting.

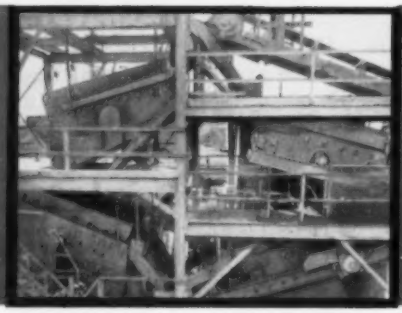
E. K. Hall, Hall & Riley Quarries, was elected president for the coming year, and R. W. Holub, Concrete Materials & Construction Co., was named vice-president. B. V. Everett, Everett Quarries, Inc., was re-elected to the office of secretary-treasurer. New directors elected to three-year terms were: Adolph Adrian, Adrian Materials Co.; Elmer Aussieker, Auxvasse Stone & Gravel Co.; and Charles Krause Jr., Columbia Quarry Co.

One of the highlights of the meeting was a panel discussion presented by associate members on various technical problems encountered by producers. Of equal interest were talks by several well known representatives of state agencies and national groups. Among these were Rex Whitton, chief engineer, Missouri State Highway Commission; Carle Newberry, Missouri Public Service Commission; Harry Blackburn, Industrial Commission of Missouri; John Kendrick, program specialist, ACP; and Robert M. Koch, president, N.A.L.I.

The panel discussion on operating factors ranged from safety and preventive maintenance on crushing equipment to the use of portable seismographs in quarry operations. New developments in highway and spreader equipment, conveyor belt maintenance, and a comparison of rotary and percussion drills were also discussed. Representatives of firms manufacturing quarry equipment made up this panel.

SAND AND GRAVEL OPERATION WITH SIMPLICITY

4′ x 12′ Model
M-9 Double Deck
Simpli-Flo Screen



The center illustration above shows the two spring and cable suspended Simpli-Flo's and the two cable-hung Gyrating Screens. The Simpli-Flo Screens are a recent addition to the plant, chosen for their economy of space and minimum support structure requirements.

6′ x 20′ Double Deck
Model MA-5, with
W-Type Deck Construction

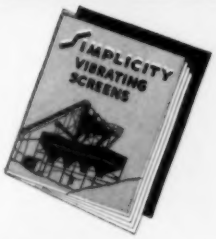
AT STANDARD SLAG SCREENS

At Standard Slag's Massillon (Ohio) plant, six high capacity Simplicity Screens combine with other fine equipment to produce 350 TPH of accurately sized aggregates.

This modern plant employs a pair of two-bearing Simpli-Flo Screens, two four-bearing Gyrating Screens and two Horizontal Screens. The versatility of the crushing and conveying system permits a variety of sizing operations, depending upon the type of material being processed.

Simplicity Screens have earned a reputation for unsurpassed durability. With minimum maintenance and high efficiency of screening at top capacity, you receive the highest profit for your screening investment. To top it off, you are assured of years of dependable operation with the fast and expert servicing offered by parts and service facilities second to none in the industry.

Drop us a line today. We'll be happy to have our sales engineer nearest you stop by and discuss your screening problems.



FREE—Write today for your copy of Simplicity's NEW Catalog S-581. Contains specifications, photographs, dimensional drawings, etc., on over 205 standard sizes, models and deck styles for Simplicity Screens and Scalpers.

Simplicity
TRADE MARK REGISTERED
ENGINEERING COMPANY • DURAND 12, MICHIGAN

SALES REPRESENTATIVES IN ALL PARTS OF THE U.S.A.
FOR CANADA: Simplicity Materials Handling Limited, Guelph, Ontario.
FOR EXPORT: Brown and Sites, 50 Church St., New York 7, N. Y.

PAUL E. MIGHT has been promoted to the post of traffic manager of the Gibsonburg Lime Products Company, Gibsonburg, Ohio. He has held various shipping and expediting positions in the seven years he has been with the company.

P. E. Might

Six men have been promoted at the Volunteer Portland Cement Company, Knoxville, Tenn. They are JAMES W. C. BOYKIN, vice-president; J. A. BOZEMAN, manager; W. S. ERNEST, chemical engineer and technical director; T. D. HANAHAN, operations superintendent; R. E. CAMP, quarries superintendent; and F. H. LEWIS, maintenance superintendent. Mr. Boykin also retains the post of sales manager.

The National Gypsum Company, Buffalo, N. Y., has promoted LINTON KOLLER to the post of manager of the newly-created Mid-Atlantic Division in Washington, D. C.

Taking over Mr. Koller's former position as manager of the Garwood (N. J.) district is JOHN P. HAYES, manager at Indianapolis, Ind.

J. FRANK HENDERSON, minerals industry design and construction specialist, has joined Kaiser Engineers, Oakland, Calif., as a development engineer in the Minerals Division. He will be responsible for the addition of new clients for the company in both the metallic and non-metallic minerals fields throughout the United States and Canada.

ARTHUR T. HERSEY, director of technical service at Alpha Portland Cement Company, Easton, Pa., sponsored a report on mortar research at the Symposium on Mortars of the American Society for Testing Materials, held recently at the Hotel Statler in St. Louis.

ROBERT M. CORCORAN has been appointed eastern region traffic manager at the New York (N.Y.) headquarters of Universal Atlas Cement Company, a subsidiary of the United States Steel Corporation. In his newly-created position, he will be responsible for the company's gypsum operations at Clarence Center, N. Y., and for transportation matters at plants in Fairborn, Ohio, Hudson, N. Y., Northampton and Universal, Pa., and Leeds, Ala.

BRADFIELD SCANTON has been named industrial relations manager of Keasbey & Mattison Company, Ambler, Pa., producers of asbestos-cement, magnesia, and asphalt products. He will handle labor relations and personnel administration. Prior to joining the firm, he was assistant manager of industrial relations for the Penn-Dixie Cement Corporation, New York, N. Y.

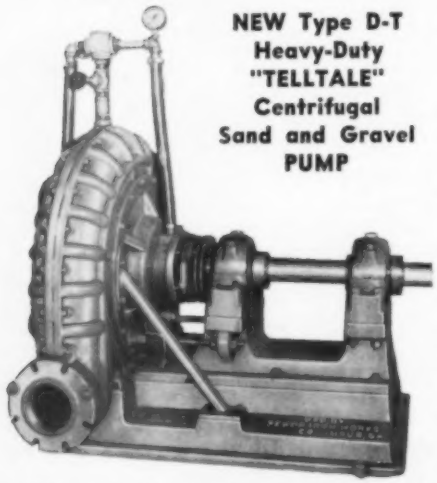
LOY C. MONTGOMERY became assistant to the president of the Janesville Sand & Gravel Company, Janesville, Wis., on January 1, 1958. He was formerly manager of the Fifield Lumber Company, also in Janesville.

GEORGE GOWEN has been appointed service engineer of the General Portland Cement Company's Florida Portland Cement Division, Tampa, Fla. Mr. Gowen was previously control engineer for the Ready Mix Concrete Company in Fort Lauderdale.

THOMAS A. BRUNS has been appointed area sales manager for the Phosphate Minerals Division of International Minerals & Chemical Corporation, Chicago, Ill. He will be responsible for sales of phosphate rock for agricultural and industrial uses in northern United States and eastern Canada.

VICTOR J. AZBE, lime consulting engineer, has just completed a world tour in a consulting engineering capacity, visiting east and west Australia, South Africa, Kenya, India, Israel, Austria, Germany, England, and Norway.

ONLY "TELLTALE" PUMPS WARN WHEN IT'S TIME TO RELINE



NEW Type D-T Heavy-Duty "TELLTALE" Centrifugal Sand and Gravel PUMP

No time-wasting look-see at the pump's insides necessary. Water leaking through the ports between the bolted halves of the outer shell tell the tale of a shell liner worn through.

When the shell liner wears through, sand and gravel quickly eat through the rope-type packing between shell liner and the shell. Hence the telltale leak.

AS LOW IN DOWNTIME AS IT IS HIGH IN PRODUCTION

The useful and exclusive telltale feature is one of all the best retained in the latest "Telltale" pump, only type we now manufacture.

Some new features: New highs in production—new lows in downtime, because of simple foolproof assembly for changing parts—also "Telltale's" own.

Available with either tough semi-steel or best-in-the-long-run Ni-Hard wearing parts in 4", 6", 8", 6 x 8" suction and 8 x 10" suction. Now available also in either alloy, 45 and 90° extra-heavy long-radius flanged elbows. Write for Type D-T Heavy-Duty folder and prices.

PEKOR IRON WORKS, INC.

LOCK DRAWER 909 — ESTABLISHED 1892 FAIRFAX 2-4020 — COLUMBUS, GEORGIA

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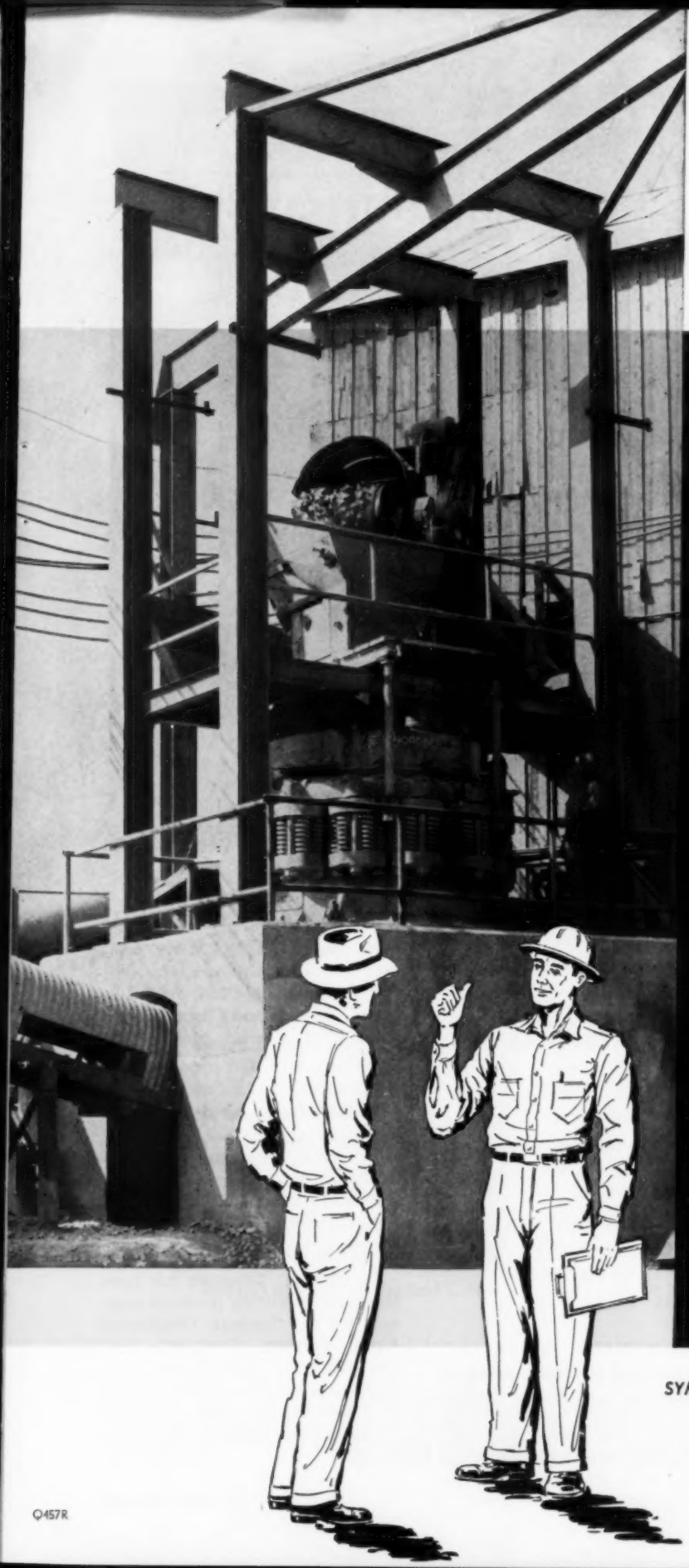
Enter 193 on card, page 239 →



You Get Increased Productivity at Lower Ton-Hour Crushing Cost by using SYMONS® CRUSHERS all the way

SYMONS . . . a registered Nordberg trademark known throughout the world.

NORDBERG MFG. CO.

Milwaukee, Wisconsin

Q457R

The National Gypsum Company, Buffalo, N. Y., has appointed CLYDE A. COOK Denver (Colo.) district sales manager to succeed Eric F. Grosse, who was transferred to the office in New Haven, Conn. Mr. Cook was formerly assistant district manager at Fort Worth, Tex.

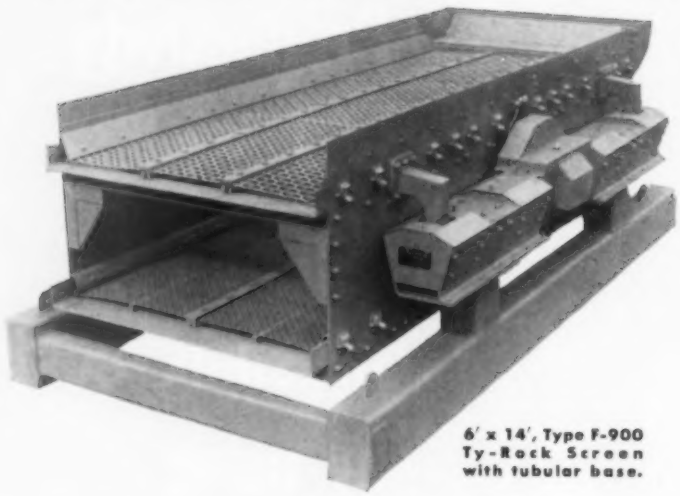
The Lone Star Cement Corporation, New York, N. Y., has elected MAJ. GEN. E. H. LEAVEY, U.S.A. (ret.), president of the International Telephone and Telegraph Corporation, to its board of directors.

Houdaille Industries, Inc., has promoted two men to key management positions in its organization.

BRANISLAUS ZAMROCK JR. has been named controller of Houdaille Construction Materials, Inc., with headquarters in Morristown, N. J. He was formerly controller of Buffalo Crushed Stone Corporation and the Gravel Products Division, both Houdaille affiliates.

Replacing Mr. Zamrock in Buffalo is ARNOLD PRESSPRICH, who will also be controller of the newly formed Concrete Pipe Division.

TY-ROCK SCREENS



6' x 14', Type F-900 Ty-Rock Screen with tubular base.

For TOP Performance

The balanced circle-throw action of the Ty-Rock plus the full-floating action on large shear type resilient rubbers enables this screen to separate material with unequalled speed and effectiveness.

The Ty-Rock wastes no power in useless, harmful racking of buildings or supporting members. It delivers all of the intense power to the job of stratifying and separating the sizes.

Telephone HE 1-5400 • *Teletype* CV 586

THE W. S. TYLER COMPANY
CLEVELAND 14, OHIO
Manufacturers of Woven Wire Screens and Screening Machinery

Enter 194 on card, page 239

TED JOHNSON has been appointed to head the newly-created Public Relations Department of the Ideal Cement Company, Denver, Colo. He is editor of the firm's monthly magazine, the *Ideal Cement Mixer*.

R. W. ZOLLERS has been named Washington (D. C.) district sales manager of United States Gypsum Company. He will move to the national capital from Syracuse, N. Y., where he held a similar post. His new sales area includes Washington and Baltimore, as well as the rest of Maryland and northern Virginia. K. C. STOWELL, sales manager of roofing products in the New York division, will replace Mr. Zollers in Syracuse.

BRYCE L. RHODES has been appointed general manager of the Phosphate Chemicals Division of International Minerals & Chemical Corporation, Chicago, Ill. He was formerly development and production staff manager.

EDWIN K. GROSS has been appointed to the sales staff of the Buffalo Crushed Stone Corporation, a subsidiary of Houdaille Industries, Inc., and will be headquartered at the company's main offices in Bowmansville, N. Y.

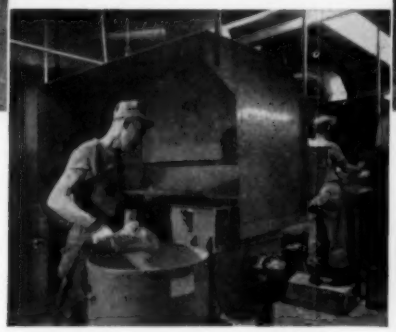
C. V. ROBINSON has been named purchasing agent and stores manager for the Chemstone Corporation, Marblehead, Ohio, a subsidiary of Minerals and Chemical Corporation of America, Menlo Park, N. J.

W. N. HALL, president and director of Dominion Tar and Chemical Company, has been elected to the board of directors of Gypsum, Lime and Alabastine, Canada, Ltd., Toronto, Ont.

EDWARD K. DENNING has been appointed insulating products manager for the Northern Division of Kaiser Gypsum Company, Inc., Oakland, Calif., and will be headquartered in Seattle (Wash.) office. Mr. Denning has been with the company's Northern Division since 1956.

dust-free plants cost less to run

This plant costs less to operate because Dracco Dust Control protects product purity and avoids serious clean-up problem. Binney & Smith, Inc., manufacturers of nationally known "Gold Medal Crayola® Crayons", selected a Dracco system to collect organic pigment dusts from production units (below).



Uncontrolled dust in your plant can impair employee health or working efficiency, shorten machine life, contaminate critical materials, cause excessive plant clean-up and maintenance costs and disrupt community relations.

You can trap dust at its source, and eliminate its nuisance, irritating, toxic or abrasive effects—with Dracco Dust Control Equipment. Men and machines work better in clean, pleasant surroundings. Absence of dirt and corrosion keeps maintenance costs lower.

If dust is sapping your profits by causing production slowdowns, downtime and personal discomfort, take positive action. Call or write Dracco today.

DRACCO DIVISION OF FULLER CO.

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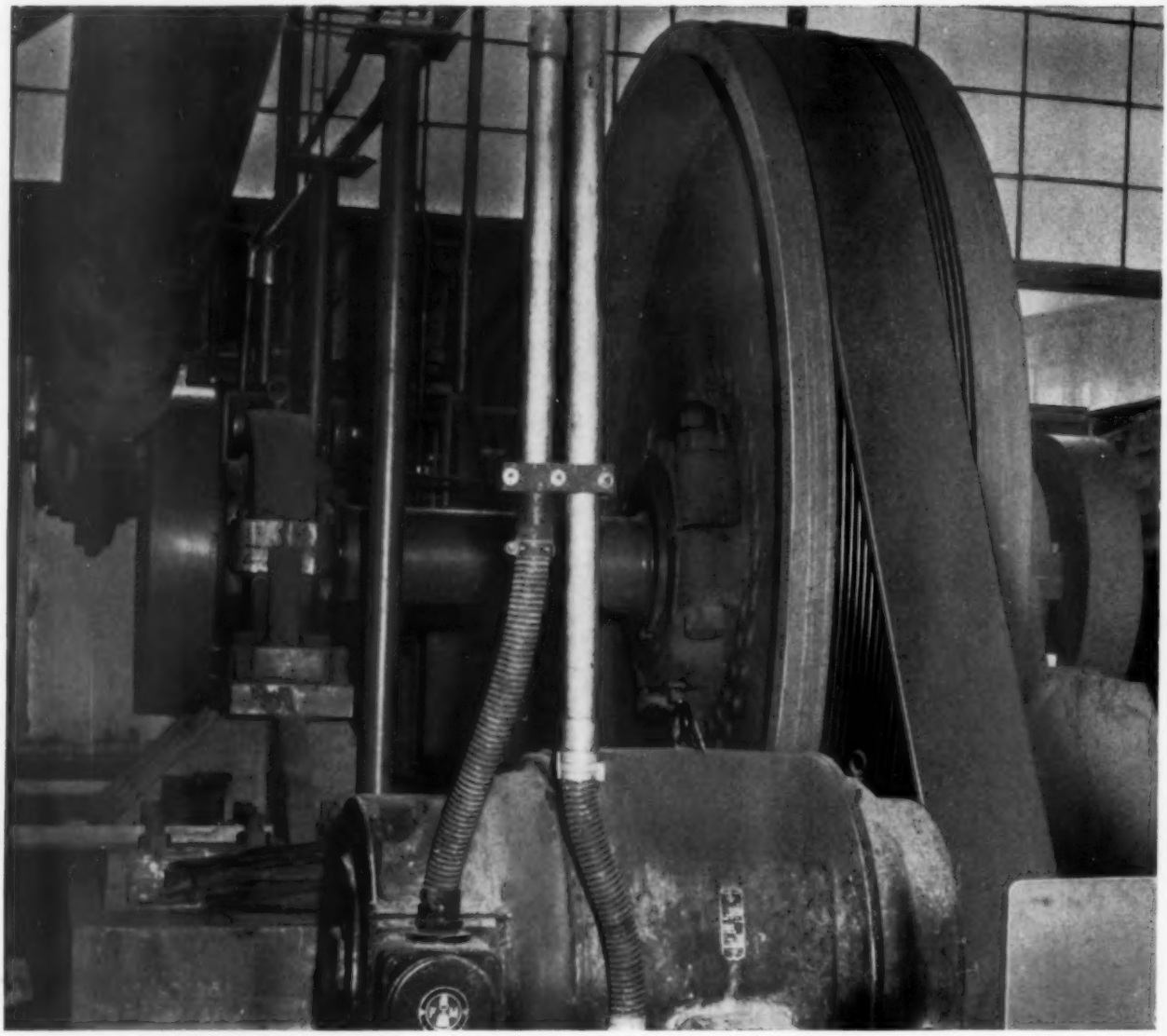
HERE'S HOW TO REDUCE COSTS WITH DRACCO DUST CONTROL:

- Eliminate health and safety hazards by stopping spread of toxic dust
- Lengthen machine life by preventing abrasive wear
- Protect vital materials by trapping contaminating dusts
- Cut plant housekeeping costs by eliminating clean-up problems
- Improve community relations by halting air pollution

Complete 40-page catalog on Dracco Dust Control Equipment contains detailed data and valuable reference material. Write for Bulletin 800.

DRACCO *airstream* conveyors
dust control equipment

FULLER COMPANY GENERAL OFFICES



R/M POLY-V® DRIVE . . . MORE POWER—LESS SPACE

. . . "More Use ~~per~~ for Your Dollar"

Patented new design makes the difference! A single, endless, parallel V-ribbed belt runs on sheaves specially designed to mate precisely with belt ribs . . . permits *narrower* sheaves to deliver *equal* power in as little as ⅔ the space of a conventional V-belt drive — or up to 50% *more* power in the *same* space! There's *less shaft overhang . . . less drive weight . . .* "*More* Use per Dollar" with R/M Poly-V* Drive.

Just *two* Poly-V belt cross sections meet *every* requirement for heavy duty power transmission.

OTHER ADVANTAGES

- **Eliminates Multiple V-Belt "Matching" Problems**
- **Reduces Wear on Belt *and* Sheaves**
- **Maintains *Constant* Speed Ratios, *No* Load to *Full* Load**
- **Cooler, Smoother Running**
- **Reduces Belt and Sheave Inventories to a *Minimum***

Write for Bulletin #6638 . . . or discuss the advantages of new R/M Poly-V Drives for *your* applications with an R/M representative.

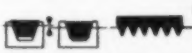
*Poly-V is a Registered Raybestos-Manhattan Trademark

HOMOFLEX HOSE — Rugged, easy handling flexible construction for use with air, water, other fluids and gases. Mandrel-made . . . uniform diameter, no preset twist. Coils and uncoils *freely* in *any* direction. Takes high pressures and surges with wide margin of safety. Homoflex Hose does a *better* job . . . and *lasts longer*. Write for Bulletin #6879.

RAY-MAN CONVEYOR BELT — Engineered for long life on tough hauls. It is tough, flexible, resists gouging and tearing. Has high fastener holding ability . . . requires no breaker strip. Other R/M belt types available for all bulk materials handling conditions. Write for Catalog 25CB. Below: World's longest one-piece conveyor belt leaves R/M plant for large mine installation.

R/M POLY-V® DRIVE

50% LESS OVERHANG
For less drive weight, less space



UNVARYING PITCH DIAMETER
Poly-V cannot sink into grooves under shock load

RM804

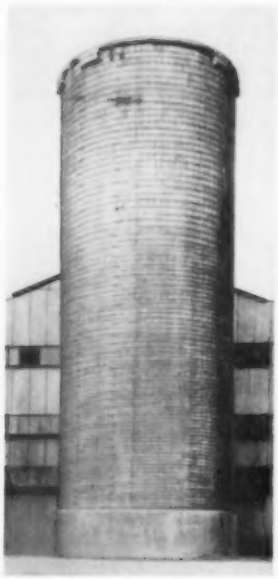
BELTS • HOSE • ROLL COVERINGS • TANK LININGS • INDUSTRIAL RUBBER SPECIALTIES

MANHATTAN RUBBER DIVISION — PASSAIC, NEW JERSEY

RAYBESTOS-MANHATTAN, INC.

Other R/M products: Abrasive and Diamond Wheels • Brake Blocks and Linings • Clutch Facings • Asbestos Textiles • Mechanical Packings • Engineered Plastics • Sintered Metal Products • Industrial Adhesives • Laundry Pads and Covers • Bowling Balls

It's what's INSIDE that counts!



1
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Most storage bins look good on the outside, BUT...

1. Have they been built to meet the required method of loading?
2. Is the storage area and inside wall built to favor the characteristics of the material to be stored?
3. Will the flow of the material meet the required volume and rate of flow at the point of discharge?

We at Neff and Fry make it a point to see that all three requirements are in balance.

NEFF & FRY COMPANY
306 Elm St., Camden, Ohio

N&F It's the STAVE that makes the difference

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Manufacturers' News

Kenworth Motor Truck Company, a division of the Pacific Car and Foundry Company, Seattle, Wash., has completed negotiations to purchase substantially all of the assets of the Dart Truck Company, Kansas City, Mo. Dart is a wholly-owned subsidiary of the Carlisle Corporation, Carlisle, Pa.

Operations of the newly-formed KW-Dart Truck Company will continue in Kansas City, where a new manufacturing and administrative facility will be constructed. On completion of the building, production of Kenworth's complete line of rock and ore moving trucks will be moved to Kansas City from the West Coast.

R. D. O'Brien, vice-president and general manager of Kenworth, is president of the new company. Carroll J. Warrell, vice-president and general manager of Dart, will continue in that capacity with the KW-Dart Truck Company.

LeTourneau-Westinghouse Company, Peoria, Ill., announces the appointment of two new distributors.

The Roy Klossner Company, San Antonio, will handle the complete line of LeTourneau-Westinghouse earthmoving, hauling, and grading equipment in southern Texas.

La-Ark Equipment Company, Inc., Monroe, La., has been appointed distributor in northern Louisiana.

The Shafer Bearing Division of the Chain Belt Company, Milwaukee, Wis., has begun operations in a new $1,000,000 addition to its plant in Downers Grove, Ill.

With the 88,000 sq. ft. addition, Shafer will have 121,000 sq. ft. of office, manufacturing, and processing space. The expansion includes a general office, machine shop, and grinding and heat-treating department.

ROBERT W. EAGER has been named manufacturing manager of the Joy Manufacturing Company, Pittsburgh, Pa.

HOWARD GOODMAN has been elected president and chief executive officer of the Goodman Manufacturing Company, Chicago, Ill. He succeeds William E. Goodman, president since 1939, who will continue as chairman of the board.

Both men, sons of the founder of the 58-year-old firm, have been closely identified with the administration of the business since 1920. In the years that William Goodman served as president, Howard Goodman acted as executive vice-president.

Howard Goodman

H. X. Wilkie

Appointment of HARRY X. WILKIE as mid-atlantic regional manager for the Davey Compressor Company, Kent, Ohio, has been announced.

In his new position, Mr. Wilkie will be in charge of the territory including metropolitan New York, Long Island, New Jersey, eastern Pennsylvania, Maryland, and Delaware.

Announcement has been made of the appointment of E. C. WHITMORE to the newly-created position of director of product planning for the Bemis Bro. Bag Company, St. Louis, Mo. Mr. Whitmore will maintain headquarters in Boston.

Completion of the plant expansion program at the South Works of the Illinois Gear & Machine Company, Chicago, Ill., has been announced. Principal feature of the program is the heavy machinery building, 300 ft. long by 80 ft. wide, with railroad track through the center.

JOHN L. McCAFFREY, chairman of the board and chief executive officer of the International Harvester Company, Chicago, Ill., retires this month after 49 years of service with the organization. Mr. McCaffrey will continue to serve as a member of the board of directors and of the executive committee of the board.

Frank W. Jenks, president, will succeed Mr. McCaffrey as chief executive officer. The office of chairman of the board will not be filled.

Mr. McCaffrey joined International Harvester as a warehouse clerk at the Cincinnati sales office in 1909. He rose steadily through the sales activities of the company, and was elected vice-president in 1940 and first vice-president in 1945. He became president in 1946, and served in that office until 1956 when he was elected chairman of the board. He has been a director of the company since 1941.

Baldwin-Lima-Hamilton Corporation, Lima, Ohio, has appointed the Western Machinery Company, with offices in Phoenix and Tucson, as Arizona distributor for *Lima* shovels, cranes, draglines, pullshovels, and Roadpacker vibratory compactors.

The Caterpillar Tractor Company was presented a Certificate of Merit, the Navy's highest award to civilian organizations, in ceremonies on April 2 in Peoria, Ill.

The certificate was awarded for outstanding service to the Department of the Navy in the development, manufacture, and production of specialized tractors for Operation Deep Freeze I, an exploration and construction mission in the Antarctic.

Directors of the Hercules Powder Company, Wilmington, Del., at their annual meeting re-elected all officers of the company as follows: Albert E. Forster, president and chairman of the board; Wyly M. Billing, John J. B. Fulenwider, John R. L. Johnson Jr., Paul Mayfield, Edward B. Morrow, Philip B. Stull, vice-presidents; J. H. T. McConnell, secretary; and John E. Goodman, treasurer.

Two new field representatives have been added to the sales organization of the Republic Rubber Division, Lee Rubber & Tire Corporation, Youngstown, Ohio.

RAYMOND T. BARTEL will be responsible for the sales and service of Republic's line of hose, belting, packing, and molded products in the Cincinnati, Dayton, and Columbus, Ohio, areas. VINCENT R. EARL will cover the state of Indiana and the Louisville, Ky., trading area.

Allis-Chalmers Manufacturing Company, Milwaukee, Wis., has appointed Euclid-Arkansas, Inc., Little Rock, Ark., to distribute its crushers and screens in the Little Rock and surrounding territory.

WILLIAM F. FOWLER JR., general manager of the Thor Power Tool Company's Aurora, Ill., administrative offices, has been named to the additional position of manager of Thor branch operations.

Toe hole drilling with Kennametal PX Rock Bits.

KENNAMETAL* PX ROCK BITS drill Pocono Sandstone 12" to 14" per minute

Using Kennametal PX600-3¼ Bits in Pocono Sandstone, this contractor gets 150 feet per grind and 8 to 10 regrinds per bit. At 12″ to 14″ per minute, drilling time is cut to a minimum.

This is typical Kennametal Rock Bit performance, made possible by several special features. Style PX Rock Bits have two water ports, located off-center where they will not clog. Setting the carbide inserts into the bit body has eliminated the need for a troublesome "center spacer." Placing the long inserts in two sections makes them stronger, for greater bit life. The "X" design eliminates rifling and speeds penetration by providing more space for fast clearance of large chips.

Ask your Kennametal Representative for a demonstration of how Kennametal PX Bits can reduce your drilling and bit maintenance time, with a low drill bit investment. Give him a call, or write KENNAMETAL INC., Mining Tool Division, Bedford, Pennsylvania.

*Trademark C-3090

Style PX Rock Bits are available in sizes from 2½″ to 5″

INDUSTRY AND KENNAMETAL ...Partners in Progress

Enter 199 on card, page 239

The Le Roi Division of the Westinghouse Air Brake Company, Milwaukee, Wis., has sold the assets of its engine business to the Waukesha Motor Company, Waukesha, Wis. The line of heavy-duty internal combustion engines made by the Le Roi Division, along with certain inventories, special tools, and equipment, make up the major assets involved in the transaction.

Le Roi will continue to manufacture smaller gasoline engines in the 30 to 50 hp. sizes for use in powering its own products, in addition to concentrating on its line of air compressors and rock drills.

Euclid Division, General Motors Corporation, Cleveland, Ohio, has appointed GEORGE M. PERRY director of sales. For the last five years he served as works manager and then as managing director of Euclid's manufacturing subsidiary in Glasgow, Scotland, Euclid (Great Britain) Ltd.

MANITOWOC AGITATORS

improve quality ...reduce costs

- Combine air and mechanical agitation
- Prevent Air Pipes from clogging
- Reduce "Step-Bearing" Wear
- Produce Perfectly uniform slurry
- Simple, Fast Acting Control Valve

You will find the modern Manitowoc Slurry Agitators the real answer to your agitating and blending problems, because they combine both mechanical and air agitation, to give you uniform, high quality cement at the lowest cost.

The Manitowoc Agitator has been designed to employ air on an intermittent cycle, as economically as possible, and at the same time employs a unique method of piping which prevents the air line from plugging.

The Manitowoc Central Control Valve is a self-contained, fast acting unit complete with air manifold and valve drive and may be very accurately timed to suit any desired operating cycle.

Manitowoc Agitators have many exclusive features and advantages, and can be engineered to meet your exact requirements even for tanks over 100′ in diameter. Write today for full details.

MANITOWOC SHIPBUILDING INC.

Manitowoc, Wisconsin

Enter 200 on card, page 239

A complete revision of sales territories and the appointment of four new regional managers has been announced by the Ottawa Steel Division, Young Spring & Wire Corporation, Ottawa, Kans.

GERALD F. FITZGERALD has been appointed to head sales in the New England states and eastern Canada. CHARLES W. SANDERS is the new regional manager in the North Central states, Manitoba, and western Ontario. WILLIAM D. LYON has joined Ottawa as regional manager in Texas and western Louisiana, with headquarters in Dallas. A. R. PHILLIPS has been appointed regional manager for the area encompassing New Mexico, Utah, and southern Wyoming.

Other changes include the transfer of Robert H. Loose from the New England territory to the Middle Atlantic states; Norman L. McArthur from the Middle Atlantic area to the Central States territory; Paul L. Ratliff from the North Central states, Manitoba, and western Ontario to the southern territory; and John D. Henley, formerly manager of the South Central territory, to the states of Illinois, upper Michigan and the eastern portions of Wisconsin, Iowa, and Missouri.

AUSTIN L. HAWK, manager of the Central Sales Region for the Manhattan Rubber Division, Raybestos-Manhattan, Inc., Passaic, N. J., died in Cleveland, Ohio, of a heart attack.

Mr. Hawk started in the Chicago office of the Manhattan Rubber Division in 1929 as a clerk, and progressed to field sales representative, manager of distributor sales, Chicago District manager, and manager, Central Sales Region.

CLEM A. KIENER, regional sales manager, Columbus, Ohio, has been named assistant general sales manager at the Hopkins, Minn., general offices of the Minneapolis-Moline Company, Minneapolis.

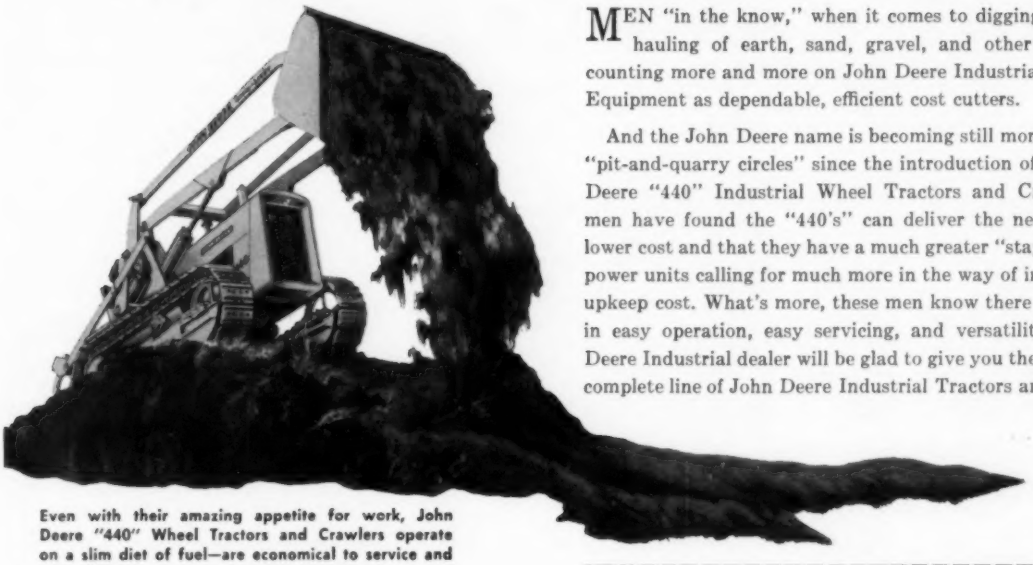
The Flexible Steel Lacing Company, Chicago, Ill., announces the retirement of WALTER MCCOMB, vice-president and general manager.

Mr. McComb has been with Flexible for 40 years, having joined the company in 1918.

Famous for Delivering SO MUCH *for* SO LITTLE *for* SO LONG

This team, the John Deere "820" Diesel Tractor and the 8-yard Hancock Scraper do a speedy, low-cost job of moving overburden, sand, or gravel. The efficiency and dependability of this outfit have won the approval of experienced operators everywhere.

JOHN DEERE *Industrial* TRACTORS



Even with their amazing appetite for work, John Deere "440" Wheel Tractors and Crawlers operate on a slim diet of fuel—are economical to service and maintain.

MEN "in the know," when it comes to digging, loading, and hauling of earth, sand, gravel, and other materials are counting more and more on John Deere Industrial Tractors and Equipment as dependable, efficient cost cutters.

And the John Deere name is becoming still more prominent in "pit-and-quarry circles" since the introduction of the new John Deere "440" Industrial Wheel Tractors and Crawlers. These men have found the "440's" can deliver the needed power at lower cost and that they have a much greater "stay ability" than power units calling for much more in the way of initial price and upkeep cost. What's more, these men know there are "bonuses" in easy operation, easy servicing, and versatility. Your John Deere Industrial dealer will be glad to give you the details on the complete line of John Deere Industrial Tractors and Equipment.

JOHN DEERE Industrial Tractors and Equipment

Completely Engineered for Industry

SEND FOR FREE LITERATURE

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Please send me free literature on the ☐ John Deere "820" Diesel, ☐ "440" Wheel Tractors, "440" Crawlers, ☐ Hancock Scraper.

*Name*_____

*Firm*_____

*Address*_____

*City*_____ *State*_____

The Oliver Corporation, Chicago, Ill., has named EDWARD KRUSE central regional sales manager, with headquarters in Cleveland, Ohio,

Edward Kruse

R. A. Dole

and R. A. DOLE eastern regional sales manager in the area extending from the Canadian Provinces south to Virginia.

Mr. Kruse, who joined Oliver in 1936 was supervisor of the Oliver industrial division's sales training program since 1952.

Mr. Dole joined Oliver in 1954, and served as New England district representative for the industrial division.

JAMES N. MASON has been named to succeed John M. Bierer as president and general manager of the Boston Woven Hose & Rubber Company, Division of the American Biltrite Rubber Co., Inc., Cambridge, Mass.

Mr. Mason joined Boston Woven Hose in 1953. He has served as vice-president in charge of manufacturing, executive vice-president, and director. When Boston Woven Hose merged with American Biltrite in 1957, he was elected a director and later a vice-president of American Biltrite.

Mr. Bierer, who has retired, will continue as a vice-president and a director of American Biltrite.

A branch office of the Ellicott Machine Corporation, dredge manufacturer, has been opened at 525 Market St., San Francisco, Calif. In charge of this office for sales, engineering, and field service on dredges of all types is CHARLES M. ROMANOWITZ, formerly with the Yuba Manufacturing Company.

Marion Power Shovel Company, Marion, Ohio, has transferred ROBERT FALCK from the central sales district to California where he will head the firm's western sales district. Mr. Falck will have charge of the territory encompassing the states of California, Nevada, Utah, Arizona, and parts of New Mexico and Idaho.

F. M. SURGUINE, formerly sales representative for the Kraft Division, International Paper Company, New York, N. Y., has been named assistant to N. P. Sparkman, western sales manager, Kraft Paper and Bags, and will move from his present location in Cincinnati, Ohio, to the Chicago office.

S. G. ANDREWS has been named Cincinnati sales representative, replacing Mr. Surguine. He will be assisted by J. A. O'Brien.

ROBERT A. OLEN, president of the Four Wheel Drive Auto Company, Clintonville, Wis., has been elected vice-chairman of the board of directors and MAURICE E. ASH has been elected president.

Mr. Olen, who has been with FWD since 1934, served the company as assistant general manager and vice-president before being elected president in 1952.

Mr. Ash has been serving as vice-president of Paradynamics Incorporated, St. Louis, Mo., which purchased controlling stock interest in FWD in January.

Bucyrus-Erie Company, South Milwaukee, Wis., has transferred its drill division activities from South Milwaukee to its newly-completed plant in Richmond, Ind. All engineering, manufacturing, and sales activities will be located there.

Space formerly used for drill manufacturing at Bucyrus-Erie's South Milwaukee and Evansville, Ind., plants will be used for the production of excavators.

GEORGE T. MOORE, vice-president and sales manager of the Wisconsin Axle Division, Rockwell Spring and Axle Company, died unexpectedly at Mercy Hospital in Oshkosh, Wis. Mr. Moore was 63 years old.

TRIAL SAMPLES

Of World-Famous WHITMORE'S Lubricants NOW IN AEROSOL SPRAY-ON CANS!

HANDI-LUBE LIQUID GEAR COMPOSITION

For open gears, sliding surfaces—exclusive formulas eliminate metal to metal contact, keep wear on the lubricant not the metal—no breakdown even after prolonged use under water—available for every climatic condition—packaged in handy 16-oz. aerosol spray-on containers or in bulk containers—send for a free trial sample.

WIRE ROPE SPRAY LUBRICANT

Exclusive formulas for lubricating and protecting wire rope, chain, springs. Penetrates to the core of wire rope minimizing internal friction and increasing usable life up to 300%—special protective qualities absolutely eliminate corrosion—non-gumming qualities reduce "carry-back"—packaged in handy 16 oz. aerosol spray-on containers or in bulk containers—send for a free trial sample.

65 YEARS OF LEADERSHIP LUBRICATING THE FOLLOWING:

- Open Gears, Dipper Sticks, Cams
- Enclosed Gear Cases
- Wire Rope and Cable
- Hydraulic Units, Torque Converters
- Roller, Ball, and Sleeve Bearings
- Speed Reducers

Est. 1893

THE WHITMORE MANUFACTURING CO.

LUBRICATING ENGINEERS

CLEVELAND 4, OHIO, U.S.A. PHONE: VULCAN 3-7272

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Aggregate Loading. Model 543 loads continuously at low cost. 15 m.p.h. travel speed. Hydraulically controlled swivel conveyor trims load. Power hydraulic boom hoist. Dual transmission. Automatic overload release. Capacity to 3 cu. yd. per min. Easily converted for coal, snow or leaves.

Screening. Model 82-A, with gravity and vibrating screens, permits screening and loading simultaneously. It loads trucks from stockpile or bank—does topsoil stripping with beater attachment. Controls within easy reach . . . no special operator required. Capacity to 3 cu. yd. per min.

Load the cheapest way with these Barber-Greenes

Snow. Model 544 loads snow at 7-11 cu. yd. per min. . . . also handles coal or easily converts to leaf or aggregate loading. 15 m.p.h. road speed and hydraulic truck-trimming conveyor boost speed and efficiency. Same features as Model 543.

Topsoil Stripping. Model 582 speeds topsoil stripping. Beater attachment available. Equipped with hydraulic swivel conveyor, it is also fast and profitable for loading from stockpile, windrow, or bank. Capacity to 3 cu. yd. per min.

Write for literature on any loader in the profit-building Barber-Greene line

58-19-L

Barber-Greene BG

AURORA, ILLINOIS, U.S.A.

CONVEYORS . . . LOADERS . . . DITCHERS . . . ASPHALT PAVING EQUIPMENT

GEORGE D. DODSON, western regional manager, has been named parts manager of the Minneapolis-Moline Company, Minneapolis, Minn., with headquarters at Hopkins, Minn. Mr. Dodson has been associated with the firm since 1930.

Announcement has been made of the promotion of JAMES E. MARTIN to the position of manager, material and equipment sales, for The General Tire & Rubber Company, Akron, Ohio.

J. R. BRANDON has been appointed manager of the newly-organized field service department, Industrial Products Divisions of Hewitt-Robins, Inc., Stamford, Conn., and J. H. HAYDEN JR. has been named product manager of conveyor equipment sales, Robins Conveyors Division, Passaic, N. J.

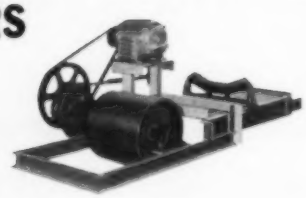
Mr. Brandon joined Hewitt-Robins in 1952. In 1953 he became manager of the service department in Passaic.

Mr. Hayden became associated with Hewitt-Robins in 1954.

TRANSALL® Endless-Economy

BELT CONVEYORS

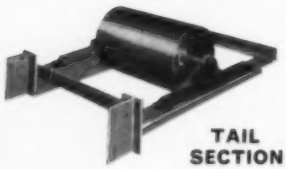
ASSEMBLE EASILY, RAPIDLY TO FIT ANY SIZE JOB



HEAD SECTION

INTERMEDIATE SECTION

NO LUBRICATION COSTS... FACTORY PRELUBRICATED FOR LIFE



TAIL SECTION

SAVE TIME AND EFFORT

At your site, assemble any length conveyor needed . . . rapidly and easily. Simply connect desired number of intermediate sections to head and tail section . . . easily lengthened, shortened or moved. Conveyor sections are available in either channel type (illustrated here) or truss type.

CUT MAINTENANCE COSTS! Factory prelubricated Transall heavy duty, **Tran-Seal** idlers do not require re-lubrication. For free illustrated folder 915A, giving full information, write or wire TRANSALL, INC., P. O. Box 1588, Birmingham, Alabama.

TRANSLATING MORE EXPERIENCE INTO GREATER ECONOMY FOR YOU.

TRANSALL, INC. 109 No. 11th Street • P. O. Box 1588 BIRMINGHAM, ALA.

Enter 204 on card, page 239

W. J. Schlapman

W. H. Vogel

Formation of a separate department to handle sales of its Utility wheel and crawler tractor line is announced by the J. I. Case Company, Racine, Wis.

Heading up the new sales operation is WILLIAM J. SCHLAPMAN, a veteran of 17 years in the construction equipment industry. Assistant sales manager of the Utility line is W. H. VOGEL, who has a background of 18 years in this field.

Until recently both men were associated with the Wagner Iron Works, manufacturer of utility tractor attachments. Mr. Schlapman was vice-president in charge of sales and Mr. Vogel was general sales manager, Structural and Machinery Division.

ROBERT N. BARR and JAMES M. CALDER were recently named to sales posts in the midwest sales offices of the Allis-Chalmers Manufacturing Company, Milwaukee, Wis.

Mr. Barr was appointed general products sales representative for the Des Moines, Iowa, district office, and Mr. Calder was named sales representative for the Detroit, Mich., district office.

PAUL DES JARDINS has been appointed manager of the new Product and Marketing Planning Department of the Worthington Corporation, Harrison, N. J.

J. D. HERSHEY has been named director of public relations for the Dayton Rubber Company, Dayton, Ohio, succeeding Ray L. Wetzel, who retired March 1.

Mr. Hershey, a veteran of 27 years with Dayton Rubber, started as a copy writer in the Tire Division, and rose steadily through the ranks to become director of sales promotion and advertising.

Enter 205 on card, page 239 →

Rock Jobs Profit from Bucyrus-Eries...Yours can too!

Loading out rock at a one million yd. cut near Elizabethtown, Ky., is this 3-yd. Bucyrus-Erie 71-B shovel equipped with torque converter drive. It is owned by Traylor Bros. Contracting Co., Evansville, Ind. The job — part of the Kentucky Turnpike project — furnished high-grade fill for other sections of the road.

Quality Limestone Co., Sussex, Wis., produces some 400,000 tons of limestone products a year. This material is sold as agricultural lime, crushed rock, and building stone. Early in 1955 this 2-yd. Bucyrus-Erie 51-B shovel was brought in to load stone at the company quarry.

On the 236-mile Kansas Turnpike about 6 million yards of rock were excavated — mostly in the Flint Hills and Topeka to Kansas City cuts. This ¾-yd. Bucyrus-Erie 22-B shovel, working near Topeka, loads out rock to be used as aggregate for a paving company. The machine is owned by Weaver Construction Co., Iowa Falls, Iowa.

At the base of Mt. Franklin near El Paso, Tex., this 38-B shovel loads rock for its owners, Standard Aggregates Co. of El Paso. The rock, blasted from the face of the mountain, is crushed at a processing plant for use in roadbuilding, asphalt mix, etc., This 38-B works at an altitude of 4,000 feet or more, where considerable dust and heat during the summer months make work difficult.

"This 38-B is giving very good service under hard work, and is most dependable," say the satisfied owners.

Hayes Quarries, Washington, Iowa, uses this Bucyrus-Erie 22-B shovel for two important jobs. Shown here loading rock at the company's "Grace Hill" quarry southwest of Washington, the machine also removes a 12 to 40-ft. layer of dirt and sandstone overburden.

The rock itself is St. Louis limestone (92% calcium content), used for road stone and concrete.

Before this machine was put on the job early in 1955, another 22-B shovel had loaded rock at the quarry for 5½ years. The owner reports there were no major breakdowns and that the machine was economical to operate.

For complete information on any Bucyrus-Erie convertible shovel from ⅜ to 4-cu. yd., contact your nearby Bucyrus-Erie distributor. He'll show you how a Bucyrus-Erie's special combination of features can make your work more profitable. Bucyrus-Erie Company, South Milwaukee, Wisconsin. 331E57C

BUCYRUS ERIE

A Familiar Sign at Scenes of Progress

The West Virginia Pulp and Paper Company, New York, N. Y., has acquired from Arkell and Smiths two multiwall bag plants located at Wellsburg, W. Va., and Mobile, Ala.

The two bag plants of Arkell and Smiths and the two plants of the Fulton Bag and Products Company at New Orleans, La., and St. Louis, Mo., acquired by West Virginia on April 1, will become components of a new Multiwall Bag Division of the paper company.

The four bag facilities will enable the paper company to serve the multiwall markets east of the Rockies, with multiwall sales offices planned for New York, Chicago, Columbus, Minneapolis, St. Louis, Kansas City, Denver, Dallas, New Orleans, Atlanta, and Charleston.

Arkell and Smiths will continue to operate its multiwall bag plants at Canajoharie and Hudson, N. Y.

EVERETT G. HARVEY has been appointed sales engineer for the H. K. Porter Company's Quaker Rubber Division, Philadelphia, Pa.

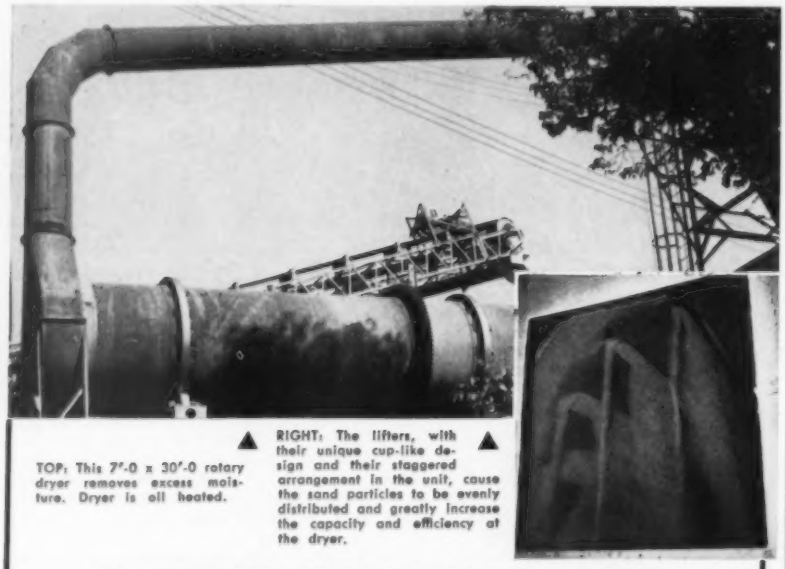
DOUGLAS E. NEWTON has joined the Western Machinery Company, San Francisco, Calif., as product manager, specializing in applications involving flotation, classification, conditioning, and other processing.

D. E. Newton

Mr. Newton brings to his new position an extensive background in metallurgical engineering, including both field and sales experience with engineering and equipment firms.

W. R. COVIN has been appointed district sales manager in the Houston, Tex., area for the Industrial Products Divisions of Hewitt-Robins, Inc., Stamford, Conn. His territory includes southern Texas and eastern Louisiana.

Mr. Covin joined Hewitt-Robins in 1947 as an assistant sales engineer.



TOP: This 7'-0 x 30'-0 rotary dryer removes excess moisture. Dryer is oil heated.

RIGHT: The lifters, with their unique cup-like design and their staggered arrangement in the unit, cause the sand particles to be evenly distributed and greatly increase the capacity and efficiency of the dryer.

A McDermott Dryer Installation at the North American Refractories Plant at Lime Gap, Pa.

Sound Engineering Economy and Consistently Superior Performance Are Built Into All McDermott

Dryers • Coolers • Kilns

McDERMOTT BROS. CO.

Allentown Pennsylvania

Phone HEMLOCK 3-3231

Enter 206 on card, page 239

Seitz Machinery Company, Inc., Billings, Mont., and Brinckman Motors, Michigan City, Ind., have been appointed new sales, parts, and service dealers for transport and ready-mix concrete trucks manufactured by the Four Wheel Drive Auto Company, Clintonville, Wis.

The Seitz organization will handle FWD four- and six-wheel-drive trucks throughout the state of Montana. Brinckman will represent FWD in the Indiana counties of LaPorte and St. Joseph.

Raybestos-Manhattan, Inc., Passaic, N. J., announces two new appointments in its Central Sales Region.

A. N. JOHNSTON JR. has been appointed manager, Central Sales Region, succeeding the late A. L. Hawk. Mr. Johnston started with the company in 1941 and was previously Pittsburgh District manager. He will make his headquarters at the Chicago office of the Central Region.

H. P. MCLAUGHLIN has been advanced to Pittsburgh District manager, succeeding Mr. Johnston. Mr. McLaughlin joined the company in 1951.

W. F. MUNNIKHUYSEN has retired as chairman of the board of the Koppers Company, Inc., Pittsburgh, Pa., and the directors have elected FRED C. FOY to the dual position of president and chairman.

Mr. Munnikhuysen joined Koppers in 1916. In 1950 he was appointed executive vice-president of the company and elected a director. In 1955 he was elected chairman and at the same time Mr. Foy who has been with Koppers since 1948, was elected president and chief executive officer.

An expansion in territory has been announced for the Lang Construction Equipment Company, distributor of crushing, screening, and conveying machinery manufactured by the Lippmann Engineering Works, Inc., Milwaukee, Wis.

Lang will now handle the Lippman equipment from its new office in Idaho Falls, covering the southeastern section of the state of Idaho.

Legal Decisions

By LEO T. PARKER
Attorney at Law
Cincinnati, Ohio

Have you ever wished you were better informed on the legal aspects of certain situations arising in your business? Perhaps you learned at that time, to your chagrin and loss, that ignorance of the law is no excuse for having made a legal blunder.

Only the well-informed plant operator can be sure of avoiding legal trouble. This article is therefore presented as a concise explanation of interesting law to assist PIT AND QUARRY readers in avoiding legal controversies. Such higher court citations can be used advantageously by readers and their lawyers to win favorable verdicts.

Legal Distinctions of Tax Laws Frequently legal questions such as the following are asked: "What are the legal distinctions between a state sales tax and use tax, as affecting purchasers who sell nonmetallic merchandise both wholesale and retail? Is a seller obligated to pay a sales tax on the full charge to the purchaser, including the transportation charges for delivering the materials to the purchaser?"

First, I shall answer this last question, which appears to be the most important. Modern higher courts consistently hold that when nonmetallic materials are delivered by a seller to a purchaser, the seller must keep books showing that the transportation charges are a separate item; otherwise, he must pay the sales tax on both the transportation charges and the selling price of the materials.

For example, in *W. Sand and Gravel Company v. State Tax Commission*, 150 Pac. (2d) 370, the testimony showed these facts: A company engaged in selling sand and gravel charged a low selling price for the materials delivered to the purchasers at the pit; but, when the company hauled the material and delivered it to the purchasers, a higher selling price was charged.

The legal question presented the court was whether the company must pay sales tax to the state on the low price of the sand and gravel at the pit, or the total price billed to the purchasers, which included the hauling charges.

In holding that the company must pay tax on the total price paid by the purchasers, including the transportation charges, the court said that failure of the company to separate the hauling charges from the pit price on its books resulted in the sales tax being due on the full charges.

This court explained that a seller is within the law by paying the state sales tax only on the price of the material at the pit, provided that the bills show the pit price of the gravel, plus the transporting charges.

State Cannot Discriminate All courts agree that a state has "inherent" powers to tax, and is free to select the subjects of taxation on a non-discriminating basis. Further, neither the due process nor the equal protection clause of the United States Constitution imposes upon a state any rigid rule of equality of taxation. In other words, a state may make distinctions of taxation degree having a rational basis. On the other hand, a state tax law is void which gives special privileges to some purchasers and users of merchandise and favors others in the same classification. Nevertheless, reasonable and non-discriminatory tax laws are valid, and a valid tax may be laid on the exercise of "personal rights and privileges." See *Carmichael v. Coal & Coke Company*, 301 U. S. 495; 109 A.L.R. 1327. In this case the Supreme Court of the United States said:

"A state legislature, in the enactment of laws, has the widest possi-

LUBRIPLATE
No. 630-2
Multi-Purpose
Grease

ALSO
PACKED IN
CONVENIENT
GREASE GUN
CARTRIDGES

Lubriplate No. 630-2 is a high temperature, extreme pressure, water-repellent, grease type lubricant. Ideal for the general lubrication of Industrial, Automotive, Construction, Farm and Marine Equipment. Lubriplate Grease Gun Cartridges provide an easy, quick, economical means of application. Prevent the waste and mess of hand filling. Packed 10 Cartridges in a handy carrying carton.

REGARDLESS OF THE SIZE AND TYPE OF YOUR MACHINERY, LUBRIPLATE LUBRICANTS WILL IMPROVE ITS OPERATION AND REDUCE MAINTENANCE

For nearest LUBRIPLATE distributor see Classified Telephone Directory. Write for free "LUBRIPLATE DATA BOOK"... a valuable treatise on lubrication. LUBRIPLATE DIVISION, Fiske Brothers Refining Company, Newark 5, N. J. or Toledo 5, Ohio.

Enter 207 on card, page 239

BUILT FOR BOULDER BUSTING BRUTES

Stop breakage problems on every kind of earthmoving job with tough, rugged *ESCO* Cast 12M Dozer Cutting Edges. *ESCO* Cast 12M Cutting Edges can take the severe punishment of longer pushes and rougher pioneering, even on the largest machines.

Careful heat treating of this *ESCO* steel alloy, 12M, makes *ESCO* Cutting Edges extra tough and hard *all the way through.* And, the same qualities that insure this breakage resistant toughness also impart amazingly high wear resistance.

You've really got the edge for low cost earthmoving and pioneering with *ESCO* Cast 12M Dozer Cutting Edges. Call your nearest *ESCO* dealer today for details.

ELECTRIC STEEL FOUNDRY COMPANY
2159 N. W. 25TH AVE. • PORTLAND 10, OREGON
MFG. PLANTS AT PORTLAND, ORE. AND DANVILLE, ILL.
Offices in Most Principal Cities
ESCO INTERNATIONAL, NEW YORK, N. Y.
IN CANADA ESCO LIMITED

ble latitude within the limits of the Constitution."

Hence, a state legislature has a wide discretion in classifying property and merchandise for the purpose of taxation, provided that its classifications are based upon differences which furnish a reasonable ground for the resulting distinctions between several classes of buyers and sellers. See *State v. Farmer's Mutual,* 176 N. W. 756.

Recently a higher court apparently broadened past concept of interstate discrimination. In *Stone v. Memphis Steam Laundry Cleaner, Inc.,* 53 So. (2d) 89, the testimony showed that a state passed a law which provides that every person desiring to engage in any business in the state must procure from the tax commissioner a "privilege" license. A seller is required to pay a relatively small license fee if his business is located in the state, but a much larger fee if the business is located outside the state.

It was contended that such a law, which permits resident business owners to pay a relatively small tax and requires out of state persons to pay a higher tax, discriminates against interstate commerce. The higher federal court refused to agree with this contention, and in holding the law valid, said:

"This tax does not violate the 14th Amendment of the Constitution of the United States or the 14th section of the Constitution of the State of Mississippi. The courts cannot require the legislature to specify its reasons for a classification of persons, firms, or corporations for tax purposes, but they should always presume that the legislature acted on legitimate grounds of distinction, if such grounds exist."

Supreme Court Broadens Licensing Powers Recently the Supreme Court of the United States rendered an unusually interesting and far-reaching decision which ultimately can affect all selling and purchasing companies.

In *Breard v. City of Alexandria, La.,* 71 S. Ct. 920, it was shown that a city passed an ordinance which provided that a solicitor, peddler, hawker, itinerant merchant, or transient vender who goes upon private property or into a home to

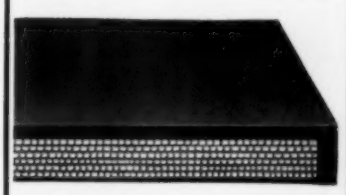
Quaker belt conveying jagged granite rock from quarry.

Here's the tough, tested belting MADE FOR THE REALLY ROUGH JOB

Take a good look at that picture. Rough, ragged, razor-sharp rock like that can take a terrific toll in conveyor belting. Or it could before Quaker came along with conveyor belting that's *tough enough to take it!*

Quaker Conveyor Belting is especially designed for the rough ones—jagged loads of ore, gravel, brick that would tear most belting to shreds in short order. There's a special Quaker belting for every special need, with flexibilities, degrees of puncture-resistance and tensile strength for the toughest quarry requirements. Even covers and internal-ply designs can be modified as your needs dictate.

Your Quaker industrial distributor can give you the details on Quaker Conveyor Belting, and assistance on *all* problems involving industrial rubber products. Call him.



Cross-section Quaker No. 1 grade conveyor belt. For toughest handling problems of almost every conveyor job. Mildew-inhibited. Available in duck, rayon duck, and cotton-nylon ducks. In all lengths, with any number of plies. In widths up to 72".

FREE CATALOG. Send for this illustrated Quaker Conveyor Belting Catalog. Write QUAKER RUBBER DIVISION, H. K. PORTER COMPANY, INC.; Philadelphia 24, Pa., or Pittsburg, California.

H. K. PORTER COMPANY, INC.

QUAKER RUBBER DIVISION

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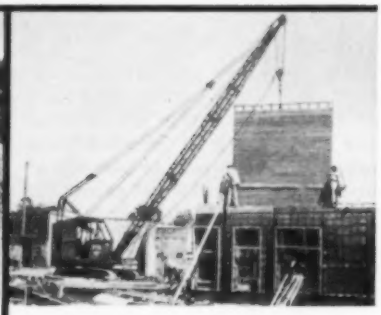
How BANTAM saves you money...

IN THE PIT . . . users get production up to 100 cu. yds. per hour digging sand or gravel with the full-revolving speed of a BANTAM shovel or dragline. This T-35 BANTAM shovel with dumping height up to 14'11", feeds a portable crusher and "doubles" on scattered assignments. With its amazing versatility and the mobility to go quickly from job to job, BANTAM offers you low purchase price, low operating costs and the big production to outwork many larger and costlier rigs.

IN THE YARD . . . a BANTAM Self-Propelled (with complete one-man operation) is the ideal machine for loading trucks and hoppers. Clamshell delivers up to 80 cu. yds. per hour with fast accurate spotting and easy maneuvering.



ON THE SITE . . . for handling concrete forms, pouring concrete and other tasks, a crawler-mounted BANTAM assures solid footing in soft mud or sand with ground pressures as low as 2½ lbs. per sq. in. Maneuvers easily in tight spots.

BANTAMS are available on 3 different types of mountings with lifting capacities up to 8 tons. All BANTAMS work with 10 different quick-change attachments. BANTAM is the most job-proved rig in the industry. Write for literature today.

RP-186

SCHIELD Bantam Co.

World's largest producer of truck cranes and excavators

219 Park Street, Waverly, Iowa, U.S.A.

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sell his merchandise, without being requested or invited to do so by the owner, is a nuisance and his act is punishable as a misdemeanor.

A solicitor was arrested while going from door to door in a city soliciting sales of his merchandise. The arrest was solely because he had violated the ordinance and had not obtained the prior consent of the owner of the residence solicited.

The solicitor appealed to the Supreme Court of the United States on the grounds that the city ordinance is void and invalid because it violates the Due Process Clause of the Fourteenth Amendment of the Federal Constitution; that it violates the Federal Commerce Clause, art. 1, section 8, cl. 3; and that it violates the guarantee of the freedom of speech and of the press made applicable to the states by the Fourteenth Amendment to the Constitution of the United States. Nevertheless, the Supreme Court held the ordinance valid and enforceable.

Need Not Prove Income An official of a cement corporation wrote asking: "If the Federal Government can not prove the income of a person received, can such a person be convicted of evasion of payment of his federal income tax?" According to a late higher court decision, the answer is in the affirmative.

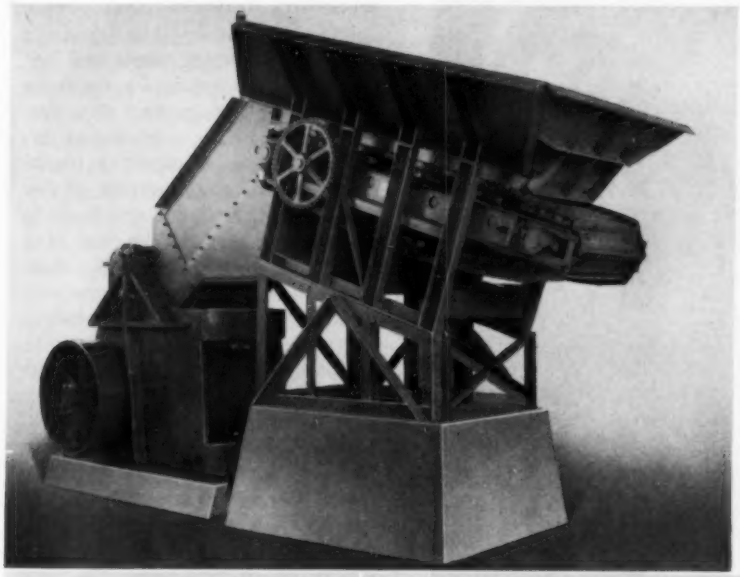
A few weeks ago a higher court upheld the law that a taxpayer can be convicted of Federal income tax evasion if proof is given that his net worth today is greater than indicated by his income tax reports a year or more previously.

For instance, in *Hasson v. Commissioner of Internal Revenue*, 239 Fed. Rep. (2d) 778, there was no definite proof that one Hasson had failed to file correct federal income tax returns, except that at the end of a three-year period he was $14,350.37 richer than he should have been, according to his reported income and expenses.

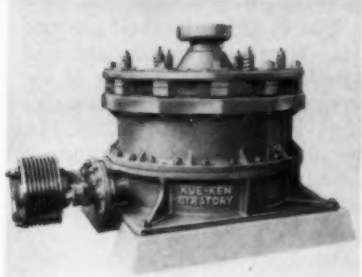
The lower court convicted Hasson of federal income tax evasion. The higher court approved the verdict, saying:

"The employment of cash hoarding is a typical method used by tax evaders. The net worth plus expenditures method does not identify the sources of the total net income

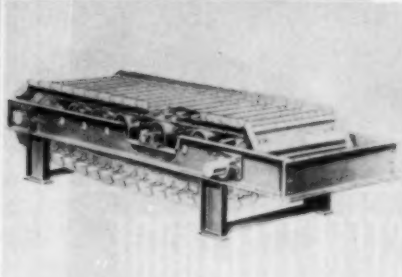
KUE-KEN® high output plants for lowest cost-per-ton crushing



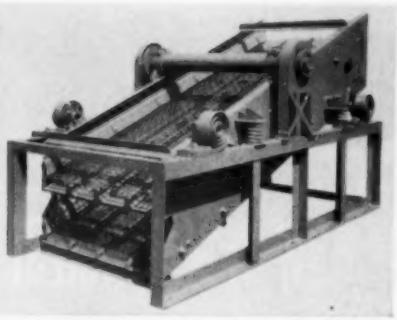
KUE-KEN 36" x 24" CRUSHER with 36" x 9' apron feeder and stationary bar type by-pass grizzley. Kue-Ken crushers in sizes from 12" x 5" to 48" x 42" as single units or in combination as shown in example (left). "Crushing without rubbing" lengthens jaw plate life 5 times or more. Built-in lubrication system avoids costly down-time. Automatic flywheel release prevents damage from tramp iron. Kue-Ken gives greater capacity for its size than any other crusher.



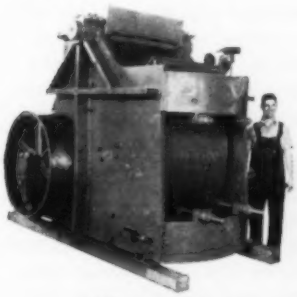
KUE-KEN GYRATORY CRUSHER fits into flow sheet where head room is limited and makes economical gyratory crushing practical in most any operation. Takes choke feed. "Crushing without rubbing" eliminates main cause of liner wear.



HEAVY DUTY APRON FEEDER. Heavy steel pans with upturned sides attached to heavy duty chain and supported on large diameter wide face rollers. Available as shown for mounting under bins or as a complete unit with hopper and gear motor drive—24" to 42" widths and various lengths.



OVERSTROM vibrating screens. Heavy duty in single, double, triple deck models up to 5' x 16'.



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KUE-KEN® CRUSHERS

"Crushing without Rubbing"

STRAUB MFG. CO., INC. 8385 Baldwin St., Oakland 21, Calif.

Jaw Crushers Gyratory Crushers Overhead Eccentric Crushers Revolving Screens
Classifiers Feeders Rib Cone Ball Mills Concentrating Tables Vibrating Screens

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PHOENIX, ARIZ. .....Stapley's
DENVER, COLO. .....Union Supply Co.
CASPER, WYOMING ....Moss Equipment & Supply Co.
VANCOUVER, B. C. .....Universal Equipment Co.

Pennsylvania Crusher Division, Exclusive Licensed Eastern Manufacturer and Distributor, 323 S. Matlack St., West Chester, Penn.
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NOW, A MANGANESE STEEL ELECTRODE
with High Build-up, Low-spatter, Easy Slag Removal

A special new Amsco rod, Nicro-Mang, for both joining and buildup of manganese steel

Out of Amsco® metallurgical research has come a new welding rod that gives you high weld strength without cracking on Austenitic manganese steel. A rod that lets you lay down a bead without slag popping, and slag removal is easy.

To lick the cracking problem, it took a special alloy of chromium and nickel, plus a unique coating for Nicro-Mang.

Write for Nicro-Mang bulletin, or see your local Amsco distributor.

Amsco Welding Products distributed in Canada by Canadian Liquid Air Co., Ltd.

AMERICAN Brake Shoe COMPANY

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thus calculated, and the burden of disproving the net worth determination of taxable income is upon the taxpayer."

State Can Tax Interstate Business Considerable controversy has arisen in the past concerning when and under what circumstances a state can lawfully tax the income of a corporation located in a foreign or different state. Last month a higher court decided this question of law by holding that a state can lawfully collect taxes on the income of a foreign coroporation if the testimony shows that the corporation's business is not strictly related to interstate commerce.

For instance, in *State of Minnesota v. Northwestern States Portland Cement Company,* 84 N. W. (2d) 373, the testimony showed facts, as follows: The Northwestern States Portland Cement Company has its main office in Iowa and is engaged exclusively in interstate commerce. Nevertheless, the state of Minnesota collected income taxes—together with penalties and interest—upon that portion of the corporation's total net income which is allocable to Minnesota. The allocated tax relates to income derived solely from interstate commerce business conducted in that state.

The Northwestern States Portland Cement Company appealed to the higher court, (the Supreme Court of Minnesota) on the contention that the state of Minnesota cannot legally and lawfully collect these taxes since its business is purely related to interstate commerce and it has only one branch office within the state, and further that it imposes a *mulitple* tax burden upon its interstate business.

Further testimony showed that five salesmen were employed in the state by the corporation, and that two of these salesmen operated out of the branch office. The corporation did not maintain a bank account in the state, and all salaries paid Minnesota employees were fixed and paid directly from the home office outside the state. Customer entertainment expenses incurred in the state of Minnesota were paid directly from the home office. Employees were compen-

sated by salary only, without provision for commissions.

In other words, the sales procedure was one of solicitation and taking orders. The salesmen received the buyers' orders, which they forwarded to the home office. There the orders were examined before acceptance. The salesmen were required to transmit all orders received to the home office daily. All contracts were executed at the home office and then sent directly to the customer. The salesmen were without authority to accept or reject a customer's order or to approve his credit. The authority of the salesmen was limited to the solicitation of sales and promotion of good will; and for all practical purposes, they were devoid of any managerial responsibility.

In view of this testimony, the higher court held that the state of Minnesota could lawfully collect taxes from the Northwestern States Portland Cement Company.

If this tax had been for the purpose of giving the company the privilege of doing business in the state, or for the use of highways in the state or the like, the law would have been invalid. But this tax was laid on the part of net profits the corporation earned in the state of Minnesota. This corporation has agents in this state who solicit orders which are mailed to the home office in Iowa. Also, the corporation has an office for service. The materials are shipped to purchasers by dealers in the state.

For comparison, see the leading case of *Spector Motor Service v. O'Connor,* 340 U. S. 602. The Supreme Court of the United States held that no tax may be levied on the net income of a foreign corporation engaged exclusively in interstate commerce. This court said:

"The State is not precluded from imposing taxes upon other activities or aspects of this business which, unlike the privilege of doing interstate business, are subject to the sovereign power of the State. Those taxes may be imposed although their payment may come out of the funds derived from (the) petitioner's interstate business, provided the taxes are so imposed that their burden will be reasonably related to the powers of the State and nondiscriminatory."

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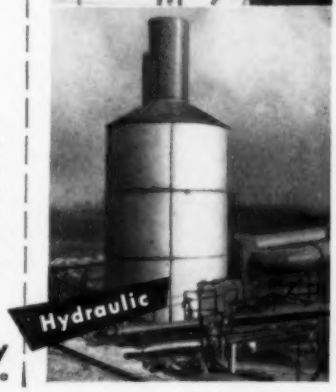
Guaranteed efficiency of fume and dust collection systems engineered and built by Norblo is obtainable because Norblo Equipment includes automatic bag type, improved centrifugal, and hydraulic types. Your operations may require one of these types — or all three! Norblo can tell you — will engineer the necessary combination to handle your dust and fume collection at most economical cost. More than 40 years experience serving many industries. State your problem so we can send literature on equipment applicable to your needs.



Replacement Bags

Dust Arrester bags do wear out eventually, and it's wise to replace them with the type best suited to your operation. Bags of various materials, made to our specifications, are available from the Norblo factory. Write for our Dust Arrester Bag Bulletin containing information on bag selection, hints for making successful bag repairs, and prices on five types of bags.

The Northern Blower Company
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Norblo ENGINEERED DUST COLLECTION SYSTEMS FOR ALL INDUSTRIES

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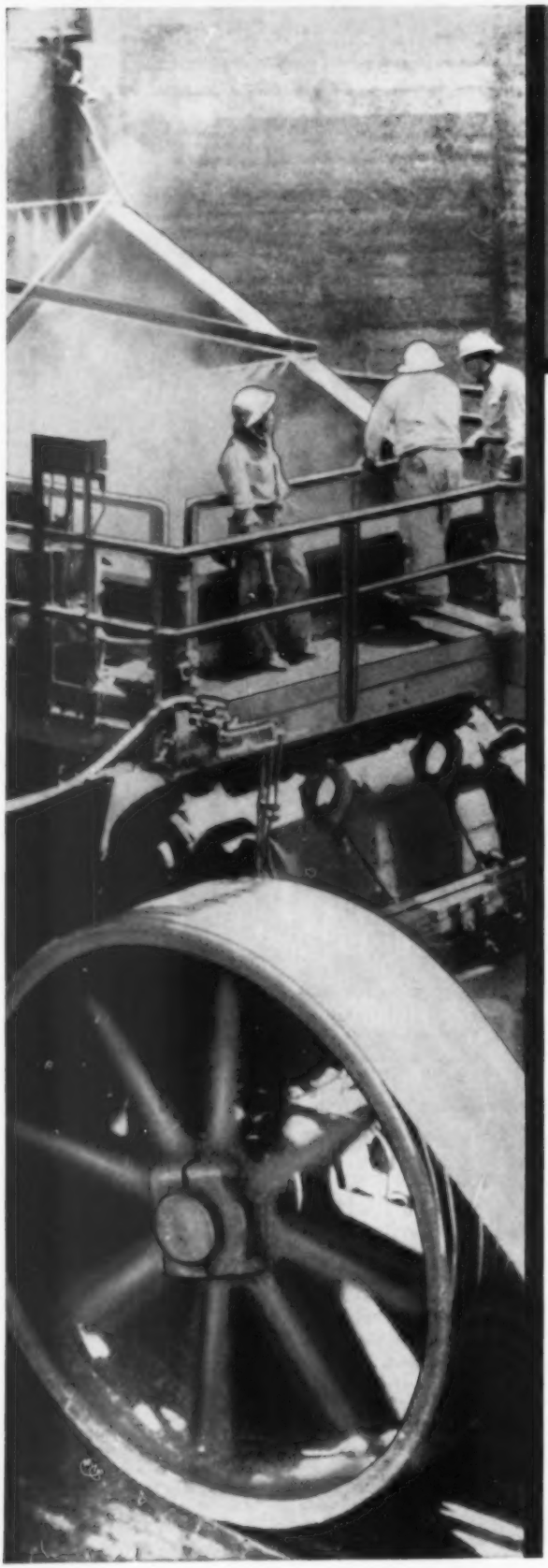

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deep-frame design
***pays off** in*
profitable performance . . .

. . . No one knows this better than the men in the field who are now operating BIRDSBORO-Buchanan Deep Frame primary jaw crushers. *Deep frame* means longer swing jaws for faster crushing to smaller sizes. You are assured of positive nipping action and less slippage. Of course, performance is best measured in figures. They are available to you along with other important design information through your Birdsboro representative. *Main Office, Engineering Department and Plant:* Birdsboro, Pa., *District Office:* Pittsburgh, Pa. *World-Wide Agent Representation.* Contact home office for nearest representative. *Canadian Representative & Manufacturer:* John Inglis Co., Ltd., Toronto, Canada.

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STEEL FOUNDRY AND MACHINE CO.

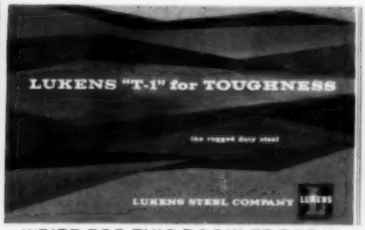
STEEL MILL MACHINERY • HYDRAULIC PRESSES • CRUSHING MACHINERY • SPECIAL MACHINERY • STEEL CASTINGS • Weldments "CAST-WELD" Design • ROLLS: Steel, Alloy Iron, Alloy Steel

Where the going gets rough...

get tough

with Lukens "T-1" Steel!

TRADE-MARK



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■ Wherever rock and gravel, coal and ores come in violent contact with machine and equipment parts, Lukens "T-1" steel—*especially extra tough 321 min. BHN quality*—fights back at wear and abrasion with spectacular success.

It is readily fabricated. You can form or weld it in the field or shop, from stock plate sizes immediately available. It can be used to replace or repair worn bucket teeth, truck and mine car bodies or liners, dozer blades, dipper sticks, crusher teeth, chutes, and many other parts.

Far stronger for its gage than conventional steel, it requires less metal to do equivalent jobs. It remains tough even at sub-zero temperatures.

Contact your nearest warehouse listed below, or write Manager, Marketing Service, 146 Lukens Building, Lukens Steel Company, Coatesville, Pennsylvania. Ask for special bulletin, *"Lukens 'T-1' for Toughness."*

WAREHOUSES

Ashland, Kentucky, Mansbach Steel Co., 19th St. & River Front
Baltimore 2, Maryland, Wm. G. Wetherall, Inc., 317 President Street
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Cleveland 6, Ohio, Mills-Wolf Steel Co., 10006 Carnegie Avenue
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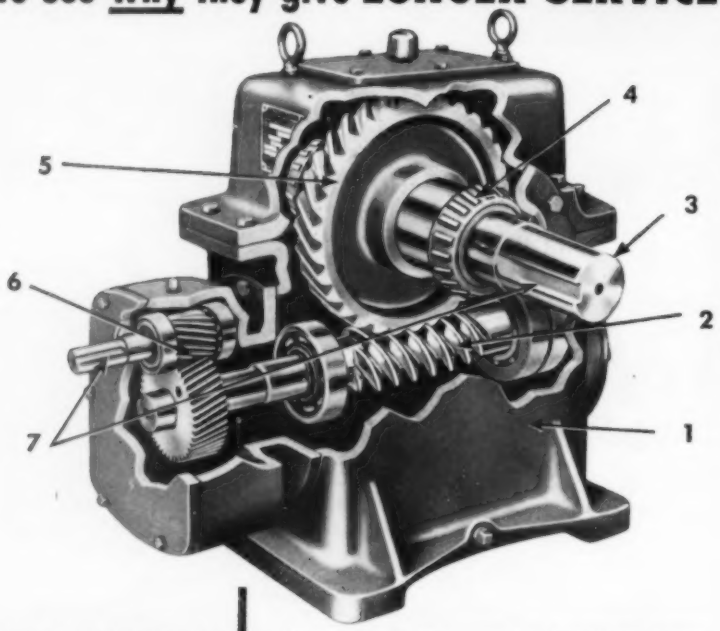
Look Inside a Foote Bros.

ENCLOSED WORM GEAR DRIVE

to see why they give LONGER SERVICE



1 EXTRA STRONG CAST HOUSING
Provides rigid mounting and alignment of caps and bearings. Made of high quality cast iron.

2 PRECISION ALLOY STEEL WORM
Integral with oversize shaft. Carefully matched to worm gear for quiet, trouble-free service.

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Oversize bearings used throughout unit. Worm bearings are combination single row radial and angular contact ball bearings. Input shaft bearings are single row radial type.

5 WORM GEAR
Precision generated from uniform density, high hardness virgin bronze alloy casting. High load carrying capacity.

6 HEAT TREATED HELICAL GEARS
Shaved for full tooth contact. Pinion integral with input shaft. Gear locked in position on worm shaft extension.

7 Just one of 10 different types, in a wide range of sizes, ratios and shaft arrangements.

One look at the oversize bearings, larger shafts, precision made gearing and the sturdy housing of a Foote Bros. Hygrade Worm Gear Drive tells you that *this* is a workhorse unit that will stand up and deliver under the toughest conditions.

Notice the carefully balanced design . . . greater mass where it's needed . . . the elimination of weight when it contributes nothing to efficiency . . . strength and toughness at the right places . . . the correct gear alloys . . . the compact design, and above all, the simplicity and ruggedness of this unit.

When you know the *inside* story of Foote Bros. Hygrade Worm Gear Drives, you can understand why they have built a reputation for quality, dependability, and performance that is unmatched by others.

Call in a Foote Bros. Field Engineer. Take advantage of our long experience in this business. Let us help you select or specify the most economical drive for your application.

Write for Engineering Manual HGB. It contains complete information on Hygrade Enclosed Worm Gear Drives.

this trademark stands for the finest industrial gearing made

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Better Power Transmission Through Better Gears

FOOTE BROS. GEAR AND MACHINE CORPORATION
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False Statement of Insured Recently I received an interesting letter from a corporation official, in part, as follows: "I want to know whether or not an insurance company can avoid payment on its policy to an employee where the evidence shows that the employee did not correctly answer questions pertaining to his health in the application of insurance, because the insurance company's agent incorrectly filled in the answers."

Generally speaking, any fraud on the part of an insured person voids an insurance policy. Last month, a higher court held that in order to avoid an insurance policy, on false statements of the insured, the testimony must show that the false statements were made willfully and with design to deceive or defraud.

For example, in *Jefferson Life Insurances Company v. Kuehler*, 298 S. W. (2d) 619, the testimony showed facts, as follows: One Kuehler filed an application for a hospital and accident policy. The testimony showed that the insurance company's agent had written all the answers to the questions and had not asked Kuehler whether he had had any medical or surgical treatment or advice within the last three years. The answer on the application was "No."

The insurance company contended that it was not liable upon the policy because of the misrepresentation made by Kuehler in the application for the insurance, wherein he stated he was in good health, both mentally and physically, and that he had not had the advice or treatment of a medical or surgical nature for the period of three years prior to applying.

It is interesting to observe that the higher court held the insurance company liable on the policy, and said:

"It is well settled that to avoid a policy of insurance because of misrepresentations. the burden is on the insurer (insurance company) to prove, not only that the answers made by the insured were false or untrue, but that the insured knew, or should have known, that they were untrue, and that he made them willfully and with the intention of inducing the insurer to issue him a policy."

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95 PAYHAULER® FLEET *speeds load-delivery 50%*

...for Central Pa. Quarry, Stripping, and Construction Co., Hazelton, Pa.

Relocating 1.9 miles of U.S. 40, east of Flintstone, Maryland, Central Pennsylvania Quarry, Stripping, and Construction Co. is moving 1,200,000 cu. yd.—90% of it rock—with five International 95 Payhaulers!

The terrain requires the deepest cut (146 feet), and highest fill (150 feet), in Maryland. The haul is 4,000 feet, with dangerous downgrades exceeding 25%.

Their Payhauler fleet is operating beside competitive haulers down the same steep haul-road. This permits accurate ton-for-ton, and penny-for-penny performance comparisons.

Here's what Job Supt. Harry G. Smith reports:

"Delivery time halved"

"The '95's' have cut costs of hauling large payloads because Torqmatic braking has cut delivery time in half over the other machines." A fully-loaded Payhauler can go down the steep grades much faster than a conventionally-braked hauler. With complete safety, too!

See how Torqmatic braking gives positive load control at any practical speed—on any grade. Try "95" get-away and climb-out speed, with the wallop of 335 turbocharged diesel "horses." Measure planetary drive axle shock-absorbing advantages. Prove production-boosting Payhauler operating ease. See your International Construction Equipment Distributor for a demonstration!

"Operators particularly like '95' operating ease, riding comfort, and maneuverability," states Job Superintendent Smith. No wonder! Controls are conveniently located. Modern power steering reduces muscle strain! Shock-swallowing seat gives "club car" riding ease!

International® *Construction Equipment*

International Harvester Co., 180 N. Michigan Avenue, Chicago 1, Illinois

A COMPLETE POWER PACKAGE: Crawler and Wheel Tractors . . . Self-Propelled Scrapers . . . Crawler and Rubber-Tired Loaders . . . Off-Highway Haulers . . . Diesel and Carbureted Engines . . . Motor Trucks . . . Farm Tractors and Equipment.

Owner Gets 20% PAYLOAD BONUS From His MARION!

MFR, 8 to 10 cubic yard body, one-inch oak liner with 3/16" wear plate and three-quarter size cab protector; HD-10S hoist.

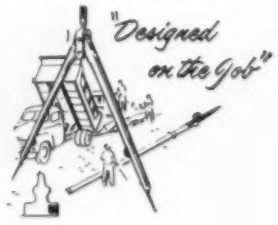
FAST OPERATION OF MARION'S HD-10S HOIST HELPS MAKE POSSIBLE EXTRA PAYLOAD TRIPS DAILY

A contract hauler working on the 300-mile Connecticut Thru-Way is realizing extra payload trips daily with his Marion hoist and body. Playing an important part in these daily bonus payloads is Marion's fast operating hoist.

The Marion unit has been on the job every working day for 6 months, hauling blue diamond sand and stone over a rough 10 miles of road. So far, it has outperformed all other units of the same size but of different make in his truck fleet.

In fact, the performance of the Marion has been so outstanding that the contract hauler has placed an order for two more Marion units with HD-10S hoists and MFR 7 to 10 cubic yard extra heavy duty contractor's bodies.

Next time you're shopping for a hoist and dump body that must do a tough job fast and well, check your Marion distributor.



MARION BODIES AND HOISTS

MARION METAL PRODUCTS CO.
MARION, OHIO, U.S.A.

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In other words, this higher court held that if an insurance agent fills in incorrect answers in an application for insurance, the insured is not responsible for such incorrect answers.

Improvements After Purchase Here is a query on improvements: "I purchased a sand and gravel plant which was unsatisfactory. Now the seller's lawyer says I can't rescind the purchase contract and recover my down payment because I attempted to make the plant operative by making necessary improvements. What is the law in this respect? It seems to me that if I spent money to make the plant operate at a profit, the defrauding seller should repay to me this expense and also refund my down payment. Please advise me about this."

All higher courts agree that a dissatisfied purchaser of a sand and gravel plant cannot rescind his purchase contract, unless the testimony shows that he promptly entered a complaint and demanded that the seller take back the plant and refund the full purchase price. Recently a higher court also held that a dissatisfied purchaser of a sand and gravel plant forfeits his legal right to rescind the purchase contract if he makes any improvements after he discovers that the seller impliedly or expressly breached the sale contract.

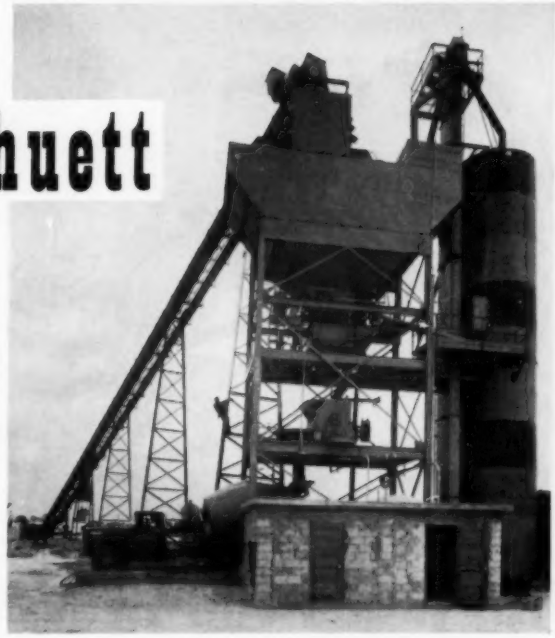
For illustration, in *Johnson v. Pherson*, 313 Pac. (2d) 1105, the testimony showed that one Johnson purchased a plant. Later Johnson found that the sewage disposal system was inadequate. Instead of complaining to the seller, Johnson made improvements to the sewage system three months after he had signed the purchase contract. Several months later Johnson sued the seller for breach of contract and asked the court to compel him to return all payments he had made on the purchase contract.

The testimony showed that Johnson made expenditures to correct the defective sewage system. In view of this evidence, the higher court held that Johnson could recover no damages from the seller and, furthermore, he could not rescind the purchase contract. The court said:

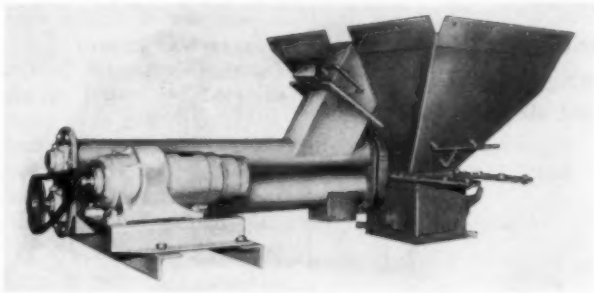
Oolite Builds Rite with Fanning-Schuett

With a fleet of 40 mixer trucks and two central mix concrete plants serving the fast-growing Miami area from Hollywood south to the Florida Keys, the Oolite Concrete Company effectively implements its well-known slogan "Build Rite . . . With Oolite". Oolite's North Dade and Bird Road central mix plants are the largest installations of their kind in Florida.

It is significant that Oolite, depending on top-quality products and customer service for continuing tremendous growth, has determined to use only the "newest and most modern equipment available on the American market". Thus, "Build Rite . . . With Oolite" is not an empty catchphrase, but a terse statement of conviction concerning the quality of Oolite products.



Oolite's North Dade plant (above) was designed and built by FANNING-SCHUETT. Precision control and dependable accuracy were the key design requirements in this 210 ton capacity central mix plant. It has a 3 cu. yd. batcher and the huge storage bin is divided into 7 compartments . . . 6 for aggregates and 1 for cement.



This Twin Screw Feeder is one of the features of Oolite's North Dade plant. Cement is fed into the top screw from the hopper and is carried forward to the end of the screw. There it is dropped into the bottom screws and the direction of cement flow is reversed. The screws are operated by a motor reducer through a chain drive. A motor brake allows instant stopping and double flighting of the bottom screw provides precision control, cutting down on over-runs or flooding. Twin screw feeders are made in 6"—8"—10" and 12" screw diameters. Single screw feeders are available as required.

FANNING-SCHUETT JOBS IN PROGRESS

FLORIDA LITH-I-BAR, INC., North Miami, Florida. —New storage bins and batchers as well as turbine mixers with special controls on cement feeding to insure quality concrete.

GORY ROOFING TILE MFG. CO., Hialeah, Florida. —The demand for roofing tile has necessitated the building of a complete new plant for this company at Boca Raton in which the latest type of batching and controls will be used to insure precision measurement of tile material.

FANNING-SCHUETT IS ALSO EMINENTLY QUALIFIED TO DESIGN AND BUILD PLANTS DEVOTED TO PRE-CAST CONCRETE PRODUCTS

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"We think there can be no doubt but that by the acts and conduct plaintiff (Johnson) was estopped from later claiming a breach of contract because of the sewage disposal system."

Layoff v. Discharge According to a leading higher court decision, the term "layoff" has legal meaning entirely different from the word "discharge."

For example, in *Anderson v. City Transit Company,* 84 N. W. (2d) 593, the higher court was asked to decide whether or not an employee was legally "discharged" when he was "laid off." The higher court held:

"Any attempt to construe the word 'layoffs' as also applying to and including 'discharge' of employees as used in the contract between the parties herein would result in the creation of an exception which would modify the contract."

Payments Not Retroactive Last month a higher court held that a state law is invalid which increases compensation payments to dependents of a deceased employee.

For illustration, in *Yaeger v. D. Granite Works,* 84 N. W. (2d) 363, it was shown that a man named Yaeger was employed by the D. Granite Works. He became totally disabled by reason of silicosis in 1948, and died as a result of the disease in 1951. Compensation in the amount of $10,000 plus certain medical and funeral expenses were paid to the dependents of the deceased Yaeger.

Later the state enacted a new law which specified $2,500 additional compensation to dependents of such employees as Yaeger. The state's industrial commission awarded this additional compensation to Yaeger's dependents. The higher court promptly reversed the award, saying:

"When a right has arisen upon a contract, or transaction in the nature of a contract, authorized by statute and liabilities under that right have been so far determined that nothing remains to be done by the party asserting it, it becomes vested and the repeal of the statute does not affect it or the action for its enforcement. . . . We therefore

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hold that the new law is unconstitutional and of no effect insofar as it purports to apply to dependents or employees who died before the effective date of the statute."

Cement Companies Show Reduced Profits in 1957

The American Cement Corporation reported 1957 net earnings of $8,527,075 or $1.99 a share, compared with the 1956 net of $10,138,045 or $2.38 a share. The earnings were the combined income of Riverside Cement Company, Los Angeles, Calif., Peerless Cement Corporation, Detroit, Mich., and Hercules Cement Corporation, Philadelphia, Pa., which merged to form American Cement on December 31, 1957.

Louisville Cement Company, Louisville, Ky., reported that net income in 1957 dropped to $2,243,916 or $5.58 per common share from the 1956 figure of $2,560,429 or $6.39 a share. Sales dropped to $12,091,701 from $14,364,000.

Missouri Portland Cement Company, St. Louis, Mo., announced its 1957 net earnings were $3,151,865, equal to $4.17 a common share, compared with $3,828,523, or $5.06 per share, in 1956. Net sales last year were $18,149,221, against $20,396,567 the preceding year.

Lehigh Portland Cement Company's income in 1957 was $7,091,622, or $1.70 a share (after a special charge deduction), a 32 percent decrease from the previous year's figures of $10,725,419, or $2.82 a share. Net sales dropped only 7 percent from $75,866,943 in 1956 to $70,407,706 last year. A major strike was said to have affected 1957 results.

Net income of the Lone Star Cement Corporation, New York, N. Y., dropped to $15,611,864, or $2.20 a share last year, from $18,882,339, or $2.60 a share in 1956. However, sales rose to $94,676,587 from $93,124,682 in 1956.

Universal's 880 Senior "R" on the Rocky Ridge Road project site. Has 30" x 26" rolls teamed with a full 48 sq. ft. of screening area.

"On this project a Universal Crusher was the lifeline of our operation"

says George Scott, partner in the firm of Stecker & Scott, pictured on the Rocky Ridge Road project, north of Sacramento, California.

"Rocky Ridge Road project called for 5½ miles of 1½" base course, nine inches thick, with 8-foot shoulders on two, 12-foot lanes. We crushed the material from 230,000 cubic yards of lava formation excavated for the cuts. In placing our low bid, we put a lot of faith in our heavy equipment, especially the Universal 880 Senior "R" Gravelmaster.

"A breakdown on our crushing operation would have idled 15 men and eight pieces of equipment. Considering operating costs and a tight profit margin, the importance of keeping all men working continuously was obvious. The Universal 880 Senior "R" kept men and material moving. We didn't miss a deadline.

"As far as production is concerned, the unit really proved itself. With this kind of performance we can bid even closer on future jobs."

There are no two ways about it. To protect tight profit margins, you've got to have equipment you can depend on . . . equipment like the Universal 880 Senior "R".

The Universal 880 Senior "R" will give *your* operation these same benefits . . . dependability, low maintenance, high production . . . for protection of tight profit margins.

On the Rocky Ridge Road project, Stecker & Scott moved the 880 Senior "R" right on the roadbed — dumped finished material directly on the road for placement with earthmovers and cut the expense of loading and trucking.

The 880 Senior "R" is built to produce. It has a 30" x 26" roll crusher with a full 48 sq. ft. of screening area. Possessing the same mobility as smaller plants, the 880 Senior "R" will increase your competitive advantage. Call your Universal distributor today.

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How a little give adds a lot of life to... AMSCO CRUSHER PARTS

Concave ring and mantle of this *Hydrocone* crusher are made of the toughest steel known . . . Amsco Manganese Steel. It *gives* a little, to take more punishment. *Hydrocone* is a registered trade-mark of the Allis-Chalmers Manufacturing Company.

Both mantle and concave ring crush a lot more feed because of certain properties of Amsco® Manganese Steel. The metal *gives* a little under crushing forces, absorbs stresses, resists cracking and chipping. Yet these same forces work-harden the surface of Amsco Manganese Steel to as much as 500 Brinell . . . a high hardness, stubborn to wear.

Amsco Manganese Steel Crusher Parts maintain their ductile undersurface and work-hardened surface even when worn thin. That's why Amsco parts endure severe abuse for so many work hours without letup.

To be sure of getting Amsco Manganese Steel, order replacement parts from your crusher manufacturer. Amsco makes manganese steel parts for most manufacturers of crushing, grinding and pulverizing equipment.

Amsco also produces other alloy steels with maximum wear resistance under particular service conditions

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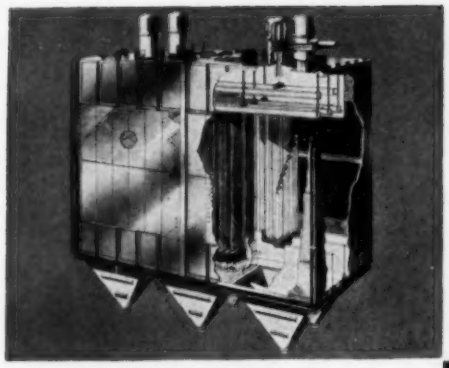
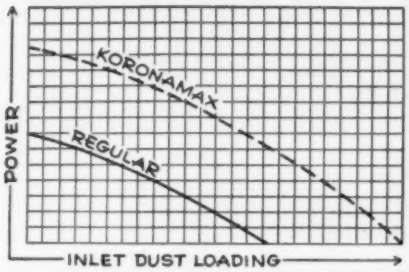
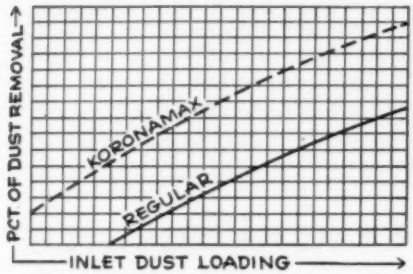


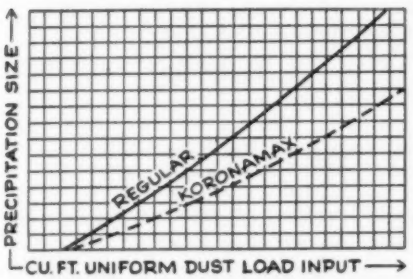
Another Koppers Exclusive in ELECTROSTATIC PRECIPITATION



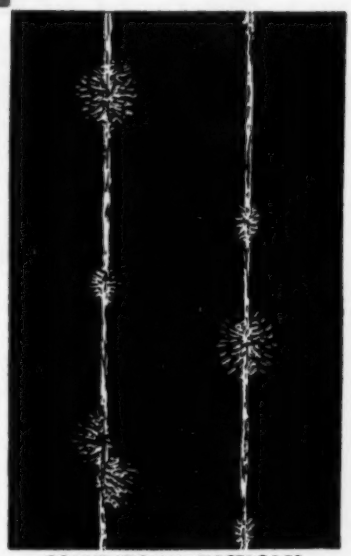
INCREASED POWER—The evenly spaced discharge points of "Koronamax" Electrodes reduce the arc-over tendency and permit increasing power input.



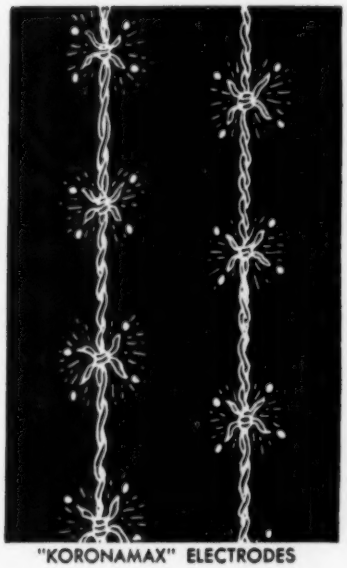
HIGHER EFFICIENCY—Replacement of regular electrodes with "Koronamax" Electrodes allows higher power input — greatly increased efficiency.



SMALLER SIZE—In new installations desired efficiency may be obtained with smaller unit when "Koronamax" Electrodes are used.



CONVENTIONAL ELECTRODES



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"Koronamax" Electrodes developed by Koppers are now in service in several different applications and their *controlled* corona discharge has resulted in greatly increased capacity and efficiency. This unique type of precipitator electrode may solve *your* gas cleaning problem.

Koppers' experience, constant research and extensive field testing have led to this important advance in precipitator design. Check with Koppers to see if "Koronamax" Electrodes can help you get top precipitator efficiency. For more information, write: KOPPERS COMPANY, INC., 9905 Scott Street, Baltimore 3, Md.

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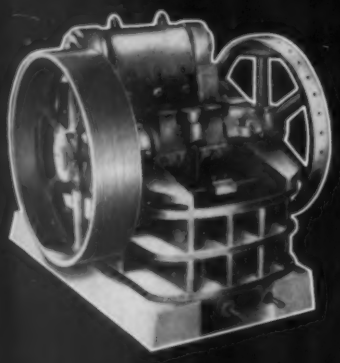

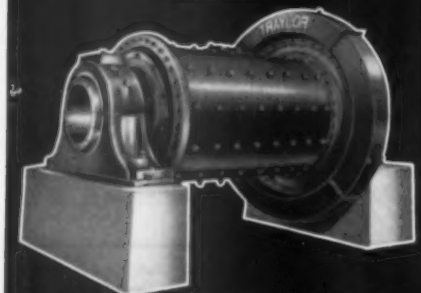

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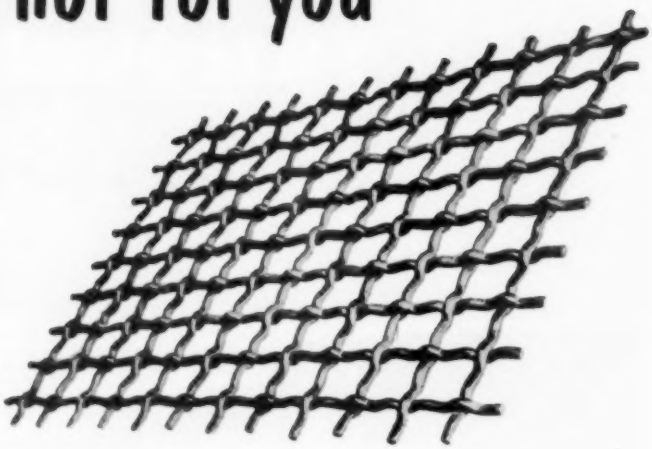

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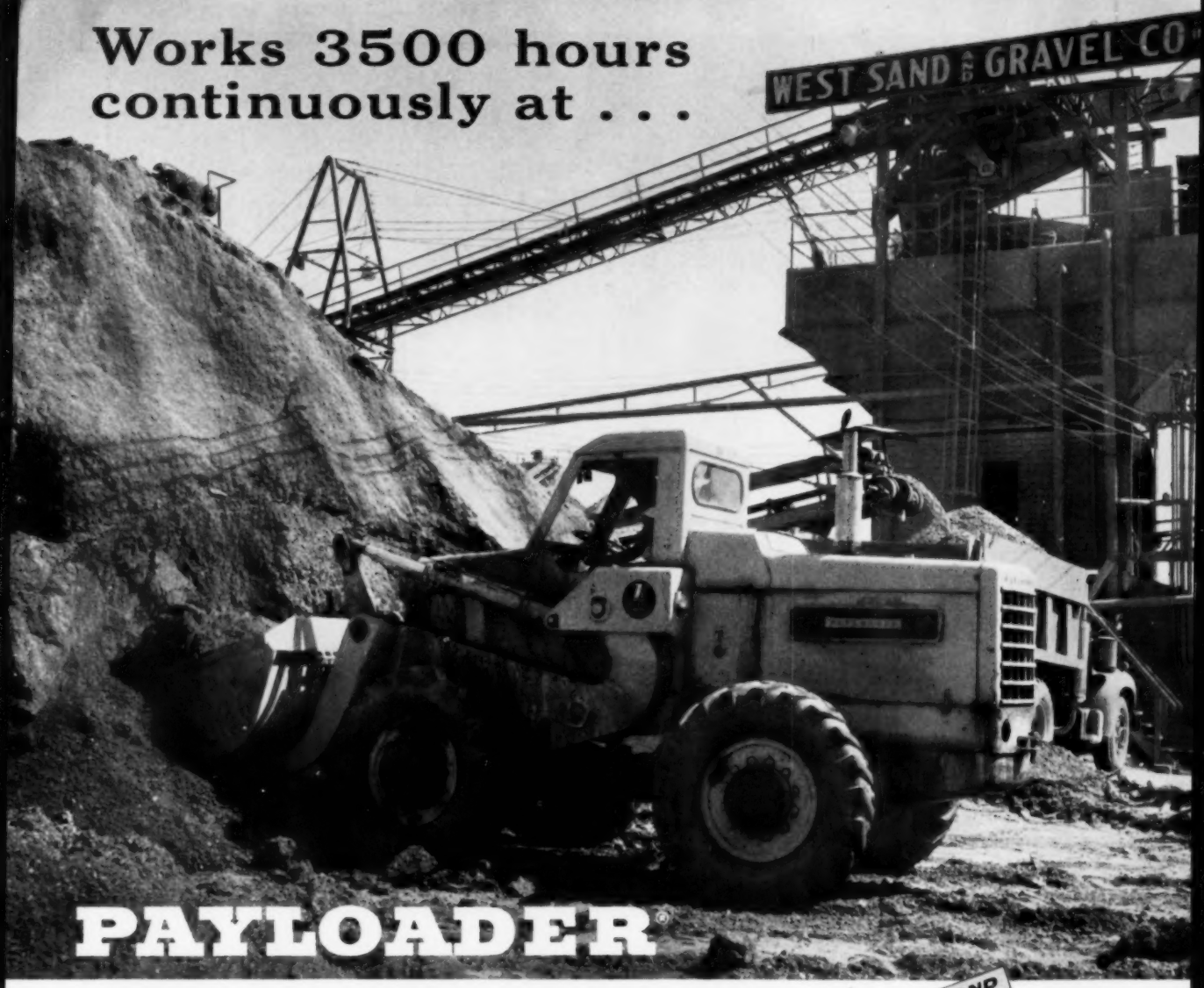

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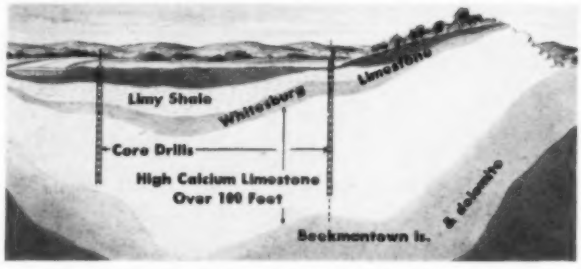
N&W plant location men will be glad to work with you in confidence and without obligation.



This diagram indicates the extent and depth of a typical limestone deposit in *The Land Of Plenty*. N&W claims relating to quantity, quality and accessibility are supported by the scientific findings of professional geologists and an independent testing laboratory.

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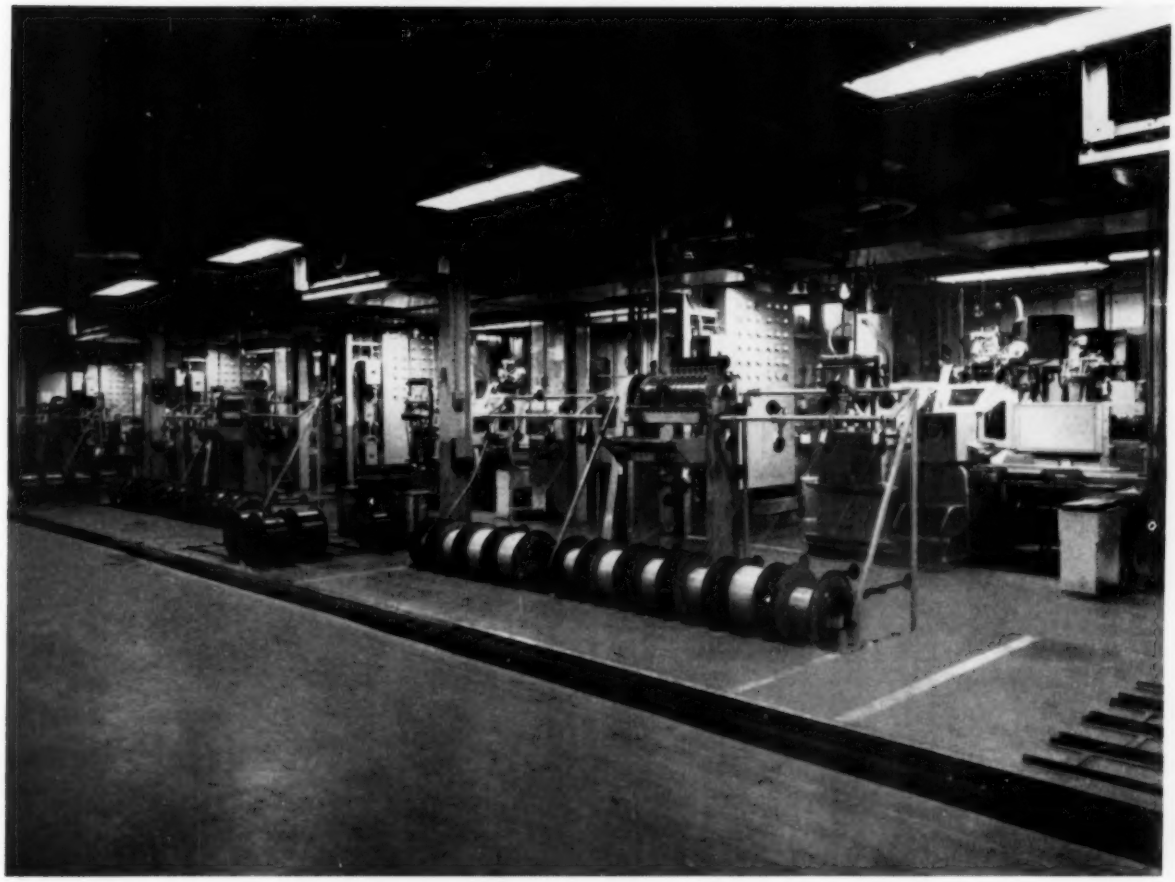

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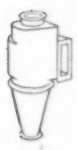
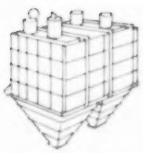
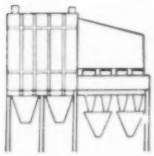


BUELL CYCLONE



"SF" ELECTRIC PRECIPITATORS

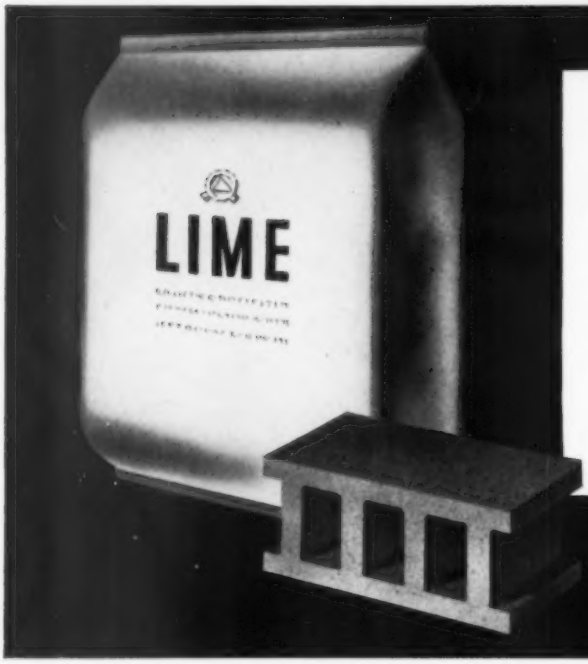


PRECIPITATOR-CYCLONE COMBINATION

buell®

Experts at delivering Extra Efficiency in **DUST COLLECTION SYSTEMS**

Tailings Go to Market - Separated by Sturtevant



10% WASTE SCREENINGS CLASSIFIED INTO PROFIT-MAKING PRODUCTS

Hills of bothersome tailings at a Mid-western rock-crushing plant are being classified into saleable products — agricultural limestone and sand for cement blocks — by a 10 ft. Sturtevant Air Separator. No extra men are needed to supervise the almost automatic unit — operating in rugged outdoor service. Screenings previously thought to have no commercial value are now going to market — **at a profit.**

THE SEPARATOR THAT UPPED 40 TO 400 MESH OUTPUT AS MUCH AS 300%

Sturtevant Air Separators range from 3 to 18 ft. in diameter: deliver fines from 40 to 400 mesh at rates as high as 65 tons per hour . . . in the cement industry, have a tested record of increasing mill capacities from 25 to 300% while lowering power consumption as much as 50% — when used in closed circuit with grinding mills.

Designed to cut costs and build profits, Sturtevant Air Separators give a lifetime of high-efficiency, low down-time service. Rugged construction plus easy accessibility for quick maintenance (typified by the "Open-Door" design in other Sturtevant equipment) assure more output per machine year.

Write today describing your problem. Please include information on material, process and desired capacity.

Address: Sturtevant Mill Company,
104 Clayton St., Boston 22, Mass.

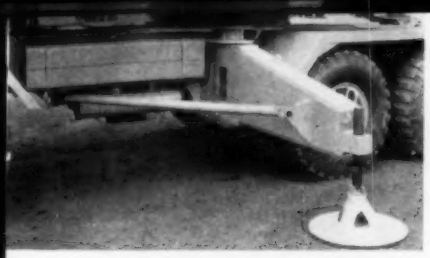
What Can a Sturtevant Air Separator Do in Your Pulverizer System?

Controlled centrifugal whirl by balancing forces separates rapidly, efficiently, cement, lime, clay, talc, ceramics, refractories, phosphates, coal and many other materials. Also used for selection of pigments, limestone, fillers, plastics, oyster shells and abrasives. Write for Sturtevant Bulletin No. 087.

STURTEVANT
Dry Processing Equipment

The "OPEN-DOOR" to *lower* operating costs over *more* years

CRUSHERS • GRINDERS • MICRON-GRINDERS • SEPARATORS
BLENDERS • GRANULATORS • CONVEYORS • ELEVATORS



AMERICAN'S EXCLUSIVE outrigger system sets up quickly, easily. Screw jacks, with large suspended aluminum floats give you fast, safe blocking. By reducing frame stresses, this revolutionary concept in outrigger design results in a lighter weight carrier—allows use of stronger machinery deck equipment for heavy duty work. It provides a stable base for handling the longest boom, the biggest loads in its class. Only the 500 Series can swing rated loads safely through a full 360° arc!

CAPABLE OF PICKING UP 150 feet of boom and 30 feet of jib—180 feet in all—this new American Truck Crane demonstrates its amazing stability, balance and power! The rugged boom sections, strongest in the field, are a full four feet square. Only the 500 Series can handle so much boom—offer such great lifting capacities in its class.

ALL NEW . . . from exclusive swinging outriggers to the longest, strongest boom in its class . . . it's the American 500 Series Truck Crane. Revolutionary new features put this heavy duty 40-ton capacity crane far ahead in on-the-job versatility, performance and operating efficiency.

NEW AMERICAN 40-TON TRUCK CRANE STRIPS QUICKLY FOR HIGHWAY TRAVEL

When you examine the all-new 500 Series, you'll find it offers an unbeatable combination of strength, low overall height, lighter travel weight and the greatest lifting capacity—with the longest boom—in its field! You can strip this machine for highway travel in amazingly short time. Counterweight, outriggers and gantry are raised and lowered by the crane's engine. Pin connections speed boom section removal or addition. The powerful carrier spreads travel weight over four axles.

Mechanically, you'll find that the 500 Series offers such important advantages as specially designed graduated air controls that give positive clutch control from smooth, easy engagement to full pressure with finger tip effort . . . liberal use of anti-friction bearings—in swing rollers as well as deck machinery . . . individually removable shaft assemblies . . . new design machinery base featuring straight-through girders and integrally welded roller supports that offer maximum strength, minimum weight and accurate roller alignment . . . engine controlled load lowering . . . engine controlled boom lowering . . . retractable high gantry . . . plus countless other job-tested features that cut operating costs, boost efficiency and keep your jobs on schedule month after month. Your American Distributor will bring you detailed information, all the facts on this important addition to the big American Excavator and Crane line that offers capacities starting at ½-yard, 12½ tons and up!

AMERICAN HOIST PACIFIC COMPANY
Special materials handling equipment

CROSBY-LAUGHLIN DIVISION
Drop forged fittings for wire rope-chain

AMERICAN HOIST
and Derrick Company
St. Paul 7, Minnesota

EXCAVATORS-CRANES to 2 yds.-50 tons
LOCOMOTIVE CRANES to 130 tons
DERRICKS-HOISTS to 800 tons
REVOLVER CRANES to 400 tons

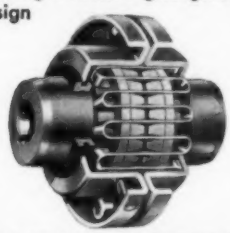
How one FALK coupling saved more than $1,000 per month

Pictured below is a Falk Steelflex Coupling assembly which connects a 2500 hp motor to a reduction unit driving an 18" bar mill in a Midwestern steel plant. This coupling replaced another type which broke repeatedly, causing maintenance expense averaging $1,000 a month—plus costly production losses. Since installation of the Falk Coupling, with its controlled torque mechanism that disengages when a predetermined overload occurs, there has been no interruption of production. Savings in maintenance and in lost production time are well in excess of $1,000 per month...dramatic proof of the importance of coupling design!

Long coupling life is not the sole criterion of coupling performance. Inadequate shaft couplings may be the cause of bearing damage or shaft breakage on your machines. If so, a change to Falk Steelflex will give two-fold protection to your connected machines: (1) compensation for reasonable degrees of shaft misalignment, and (2) torsional resiliency to reduce peak loads as much as 30%. These advantages are as important to you as the long service life of the Falk Steelflex Coupling itself.

Falk Steelflex Couplings, in types and sizes to meet virtually all industrial applications, are promptly available from distributor, warehouse and factory stocks. Consult your Falk Representative or Authorized Falk Distributor.

Basic **Type F**—cutaway view showing exclusive grid-groove design



THE FALK STEELFLEX ...a truly flexible coupling

Here is the coupling that has all the strength of steel, yet is truly flexible. *More than a million* have been bought for industrial service of many kinds.

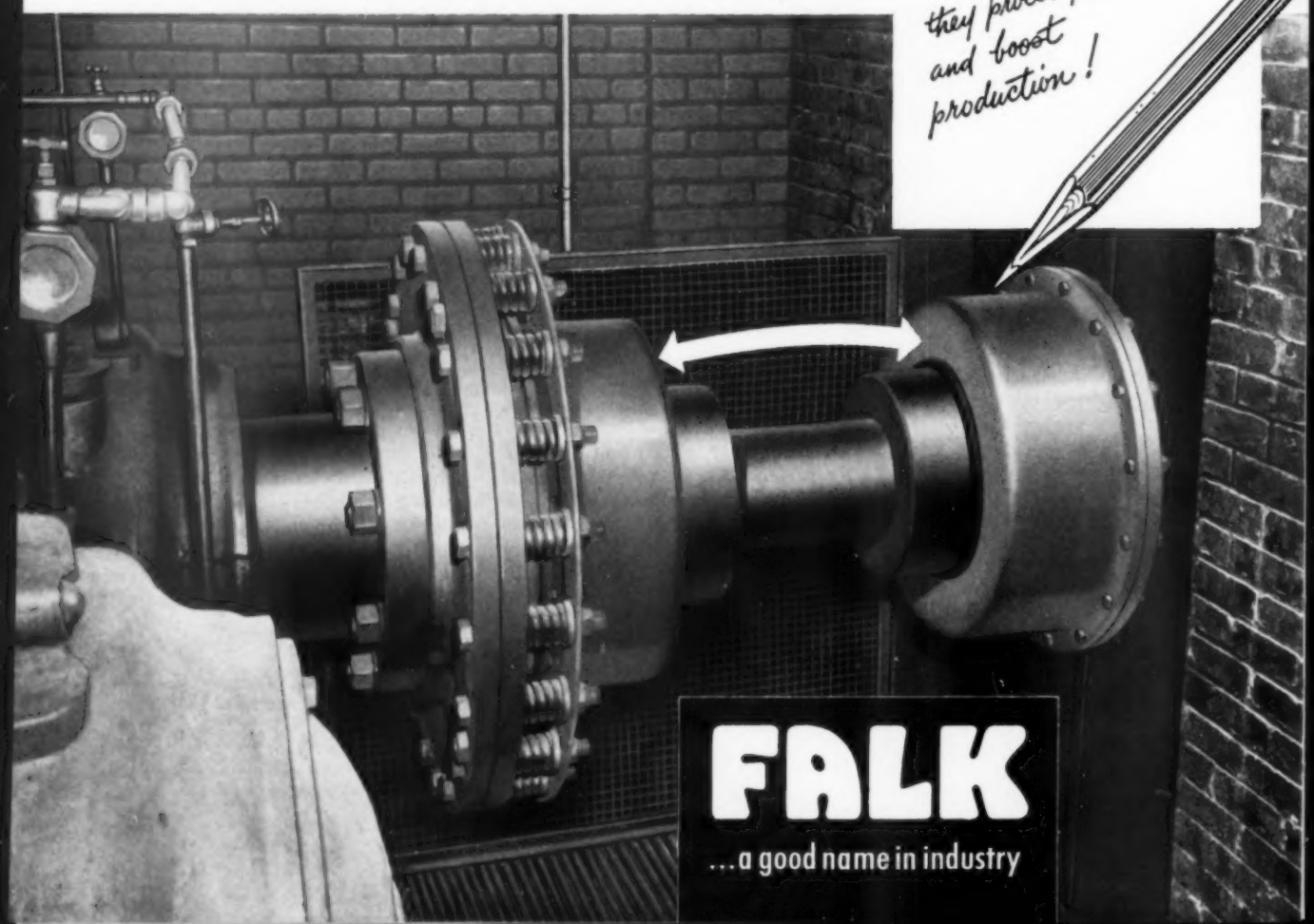
Because, in addition to its inherent superiorities of design, the Type F Steelflex can be used horizontally or vertically without modification or special parts, it has been adopted as standard in many plants—and by many designers and manufacturers of industrial equipment...Write for Bulletin 4100.

THE FALK CORPORATION, MILWAUKEE 1, WISCONSIN

MANUFACTURERS OF QUALITY GEAR DRIVES AND FLEXIBLE SHAFT COUPLINGS

Representatives and Distributors in many principal cities

Good couplings not only connect machines; they prolong machine life and boost production!

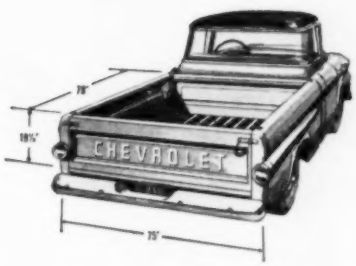


NEW FLEETSIDE BY CHEVROLET

Here's the new sweetheart of the Task-Force fleet, Chevrolet's new Fleetside pickup! No truck has ever been better to look at . . . or better for your business.

Long, sweeping lines, graceful body contours . . . *new* truck appearance that's fleet, dashing and completely modern! Yet there's even more to the new Chevrolet Fleetside than the striking beauty that first meets your eye. There's *size*, for instance: extra room inside to pack many additional cubic feet of payload. And with double-walled lower side panels, durable hardwood floor, and solidly constructed full-width tailgate, the new Fleetside is the toughest of pickup bodies, too! A new adjustable latch keeps graintight tailgate free from rattles.

Here's a new high in hard-working utility, matched by new styling that makes you stand out on any street. See the new Fleetside at your Chevrolet dealer's now! . . . Chevrolet Division of General Motors, Detroit 2, Michigan.



More load space than any other comparable low-priced pickup. In lengths of either 78 inches or 98* inches and a full six feet in width, this new body actually provides 50% more cubic capacity than the conventional pickup box! **Optional at extra cost.*

Plenty of work-whipping hustle and muscle. Your choice of two great engines—standard 145-h.p. Thriftmaster 6 or optional at extra cost 160-h.p. Trademaster V8. And truck-engineered chassis components will take all the abuse your most bruising hauls can give them!

CHEVROLET **CHEVROLET TASK·FORCE TRUCKS**

NO BLOCKS IN THIS LOAD!

(THANKS TO CYANAMID EXPLOSIVES)

With any rock formation, you have the right to expect every well-planned blast with Cyanamid Explosives to give you perfect results. You'll be sure to get the kind of breakage that makes shovel production . . . loading . . . handling . . . and crushing . . . a money and time-saving pleasure.

When blasting is right, all other operations go smoothly and economically. That's why it's a wise idea to rely on Cyanamid Explosives, and make every shot pay off!

American Cyanamid offers you a national network of magazines and plants . . . quick delivery . . . expert technical service . . . and a complete line of highest-quality materials.

CYANAMID

AMERICAN CYANAMID COMPANY
Explosives and Mining Chemicals Department
30 Rockefeller Plaza, New York 20, New York

DISTRICT SALES OFFICES: St. Louis, Missouri • New York City, New York • Latrobe, Pennsylvania • Pottsville, Pennsylvania • Scranton, Pennsylvania Dallas, Texas • Salt Lake City, Utah • Bluefield, West Virginia. **THE CYANAMID LINE:** High Explosives • Permissibles, • Seismograph Explosives Blasting Agents • Blasting Powder • Blasting Caps • Electric Blasting Caps • Blasting Accessories.

More Information, Please

Use the prepaid postcard to get this literature or additional details about new equipment and products reported elsewhere in this issue.

1958 TRUCK AND TRAILER SIZE AND WEIGHT RESTRICTIONS for each of the 48 states and the District of Columbia are compiled in a pocket-size booklet prepared by the *Four Wheel Drive Auto Company.* **(301)**

AN AEROSTATIC DUST COLLECTOR for use in air pollution control and for product recovery in cement plants and processing operations is discussed in a 6-page bulletin prepared by *Hagan Chemicals & Controls, Inc.* **(302)**

THE KENNEDY CUBER JUNIOR for primary and secondary impact crushing is described in a bulletin available from the *Kennedy-Van Saun Manufacturing & Engineering Corporation.* Specifications include capacities to 250 t.p.h. in closed circuit, with connected horsepower from 75 to 150. **(303)**

AN OFF-THE-ROAD TIRE HANDBOOK published by the *B. F. Goodrich Tire Company* tells how to get maximum service from off-the-road tires. Such factors as load, inflation, operating conditions, and tire care are discussed. Also included is a description of the Goodrich line of off-the-road tires. **(304)**

COUNTERSUNK CRESCENT BELT FASTENERS for conveyor belting are covered in literature released by the *Crescent Belt Fastener Company, Inc.* The booklet contains an illustration of this type of joining in use and a cross-section drawing which illustrates the countersinking features. **(305)**

MODEL LS-98 SHOVEL-CRANE, a 1-cu. yd. shovel, crane, dragline, and hoe, is featured in a catalog released by the *Link-Belt Speeder Corporation.* The LS-98 is depicted in detail from the crawler tracks to the upper machinery and the various front end attachments. **(306)**

A CAST IRON PULLEY CATALOG published by the *Jones Machinery Division, Hewitt-Robins Inc.,* contains a listing of all standard pulleys and accessories available from the company. **(307)**

VIBRALOY WOVEN WIRE SCREENS are detailed in a comprehensive catalog offered by the *Audubon Wire Cloth Corporation.* Included are detailed screen specifications for 6-in. down to ⅛-in. openings, in light, medium, heavy, and extra-heavy gauges. **(308)**

TYPE H JAW CRUSHER manufactured by the *Traylor Engineering & Manufacturing Company* is pictured on location in various operations in newly-released Bulletin 6105. Charts, specifications, and other information contained in the bulletin will enable operators to select crushers based on the feed and size required. **(309)**

COUPLINGS in the *John Waldron* line are covered in a new bulletin which describes the Waldron standard gear coupling, Francke flexible, the 162 "M" nylon gear coupling, the Waldron Junior, the Anchor Waldron cut-out coupling, and the Smith & Serrell Flexpin and Flexring. **(310)**

PNEUMATIC ROCK DRILLING ACCESSORIES are featured in a catalog pre-

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CHICAGO 5, ILL., U.S.A.

May ***PIT AND QUARRY*** **1958**

Insert key numbers found below items on advertising, literature, and new equipment pages. Print company name if not keyed.

_____ _____ _____ _____ _____ _____

_____ _____ _____ _____ _____ _____

Name _____ Title _____

Company _____

Address _____

City _____ Zone _____ State _____

We Produce _____

Remarks: _____

More Information, Please

Use the prepaid postcard to get this literature or additional details about new equipment and products reported elsewhere in this issue.

pared by *Brunner & Lay, Inc.* Included are detailed specifications covering the complete line of carbide drill bits, drill steel, couplings, adapters, extension steel, etc., plus money-saving application data. **(311)**

ATLAS POWDER COMPANY has prepared two booklets for use with the Atlas Blasting Cost Chart. One booklet is a comprehensive discussion of blasting costs; the other is a more detailed instruction booklet for using the chart. **(312)**

BELT CONVEYOR MANUAL NO. 909, released by *The Jeffrey Manufacturing Company,* provides information for selecting the right conveyor for all but the most unusual applications. **(313)**

HD-16 DIESEL CRAWLER TRACTOR is the subject of a catalog issued by the *Allis-Chalmers Manufacturing Company.* Illustrations and text highlight the features of the HD-16. Specifications and a cutaway view of both gear transmission and torque converter models are included. **(314)**

A STONE CRUSHER BULLETIN published by the *American Pulverizer Company* describes and illustrates construction features, capacity ratings, dimensions, hammer types, and other pertinent information to aid in the selection of the hammer mill best suited to your operations. **(315)**

ORE TESTING SERVICES offered by the laboratories of the *Denver Equipment Company* are described in Bulletin No. T4-B21. Types of testing facilities available for both batch and pilot plant investigations are detailed. **(316)**

"HOW TO BE A WIRE ROPE EXPERT" is the title of a 16-page illustrated booklet released by the *Leschen Wire Rope Division, H. K. Porter Company, Inc.* The booklet explains the basic principles governing the selection of the proper rope construction for any job. **(317)**

A MANGANESE STEEL CHAIN CATALOG offered by the *Taylor-Wharton Company* illustrates a wide variety of chain types which become work-hardened with use. Specification of the proper chain design is simplified by charts which list all dimensions for each type, and include data on ultimate strength, working loads, matching sprocket types, and special purpose attachments. **(318)**

ROL-MAN ROLLED AND FORGED HIGH-MANGANESE STEEL is described and its applications are listed in a new booklet issued by the *Manganese Steel Forge Company.* **(319)**

MODEL 1205 EXCAVATOR is described in a new catalog released by the *Koehring Division, Koehring Company.* On-the-job and assembly photos, capacities, a weight chart, and a diagram showing disassembly are included. A special section is devoted to the car body and lower machinery. **(320)**

MAY-FRAN CONVEYORS are described in Catalog MF-100, available from *May-Fran Engineering, Inc.* Featured are May-Fran standardized conveyor component parts to enable users to create conveyor systems of their own design. **(321)**

May ***PIT AND QUARRY*** **1958**

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_____ _____ _____ _____ _____ _____

_____ _____ _____ _____ _____ _____

Name_____ Title_____

Company_____

Address_____

City_____ Zone_____ State_____

We Produce_____

Remarks:_____

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CHICAGO 5, ILL., U.S.A.

← Detacord branch line is connected at a right angle to the Detacord trunk line with a double half hitch, drawn up tightly around the trunk line.

Cutaway view of rock chunk shows simple method of threading Detacord through primer cartridge. No blasting caps required in holes.

Photograph shows part of a small secondary blast hooked up and detonated with Detacord. Note the trunk line connected with a double half-hitch.

DETACORD®

An effective, economical detonating fuse for Secondary Blasting, Long Hole Underground Blasting and Pipe Line Ditching

For this secondary blast, Detacord is used to prime the charge in each of the large chunks. A trunk line of Detacord connects with these branch lines and is, in turn, detonated with fuse and cap (or electric blasting cap). Result: an instantaneous blast which will "go" only when you give the word, with no danger of a premature caused by stray currents.

Detacord is a "little brother" to Primacord. It comes from the same family but it's smaller, less powerful. The core of PETN is not as large as in Primacord – and for this reason Detacord should *not* be used in primary blasting. But for secondary blasting, long hole underground and pipe line ditch blasting you'll find it effective – *and economical.*

Detacord has a waxed textile cover, light brown with cross windings of red yarn forming an X pattern. It is very flexible – is easily tied in square knots and half hitches as shown. Tensile strength 100 lbs. 500-ft. spool weighs 8 lbs.; 1000-ft. spool weighs 16 lbs.

See your explosives supplier or write for further information

THE ENSIGN-BICKFORD COMPANY

Simsbury, Connecticut • Since 1836

Detacord® and Primacord® Detonating Fuse • Safety Fuse • Ignitacord® Quarrycord® • Pyrotechnical Devices and Blasting Accessories

The entire blast is detonated with fuse and cap (or electric blasting cap), the cap taped securely to the end of the Detacord trunk line, with the business end of the cap pointing in the direction of the explosive wave. D-2

Ni-Hard Drop Balls smash records, too . . .

In a Georgia granite quarry a seven-ton Ni-Hard* Drop Ball (illustrated) lasted four times longer than a forged steel ball.

In a South Dakota silica quarry a two-ton Ni-Hard skull-cracker lasted twice as long as a forged steel ball.

Two different rock-breaking jobs! Two records for Ni-Hard cast iron. Two of dozens Ni-Hard has made. Chances are Ni-Hard can mean a big reduction in rock-breaking costs for you, too.

That's because this nickel-chromium white cast iron has superior abrasion resistance with ample toughness to resist cracking.

Ni-Hard castings keep right on working under the toughest operating conditions. Pay off in longer life...fewer replacements.

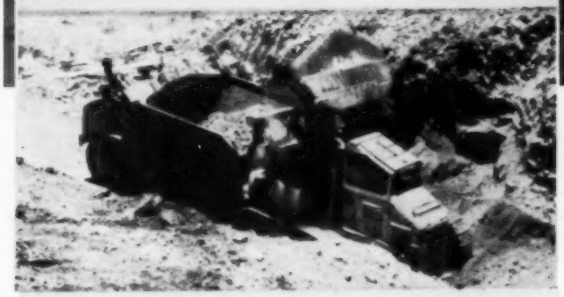
Use Ni-Hard drop balls for secondary rock fragmentation to help pare your costs. For a list of authorized Ni-Hard producers write the address below.

*Registered trademark

INCO TRADE MARK **THE INTERNATIONAL NICKEL COMPANY, INC.** 67 Wall Street New York 5, N. Y.

View of one section of assembly line.

EIMCO 105 DOZER — Maneuverability + Speed + enough power to move any load = PROFIT



EIMCO 105 EXCAVATOR (Overhead) — Maximum Crowding force for high capacity excavating + high production loading efficiency = PROFIT

EIMCO 105 FRONT END LOADER — Rugged construction + Tremendous break-out force + maximum stability for high capacity loads (shown above) = PROFIT

HIGH PRODUCTION UNITS

Here is a view you would see any day at Eimco — Dozers, Excavators and Front End Loaders coming down the assembly conveyor line in the big Eimco shops.

Filling repeat orders from users who have learned from experience that Eimco built machines are the high production units designed for really profitable operations.

If costs are eating your profit margins why be hindered with the habit of buying old style tractors.

In the Eimcos you get the quality you pay for as Eimco customers have been doing for almost 75 years.

THE EIMCO CORPORATION

Salt Lake City, Utah—U.S.A. • Export Offices: Eimco Bldg., 52 South St., New York City

New York, N. Y. Chicago, Ill. San Francisco, Calif. El Paso, Tex. Birmingham, Ala. Duluth, Minn. Kellogg, Ida. Pittsburgh, Pa. Seattle, Wash.
Cleveland, Ohio Houston, Tex. London, England Gateshead, England Paris, France Milan, Italy Johannesburg, South Africa

B 323

Buren C. (Sandy) Herod, Field Editor, taking notes and pictures for an "on-the-spot" editorial feature.

James G. Kostka, Research Director, out in the field getting first-hand information on the operation of a conveyor system.

These pieces fit ...

Good Editorial and Field Research

Two Members of PIT AND QUARRY's Editorial and Research Staff

BUREN C. HEROD

Field Editor, Geologist, field experience in mining operations and explorations. Formerly associated with mining and geologic consulting firm, and with U.S. government as mining geologist in nonmetallic minerals industry.

JAMES G. KOSTKA

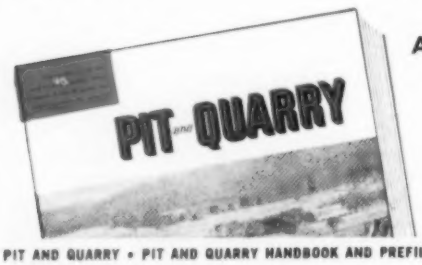
Director of Marketing and Research. Has 15 years of marketing and research experience, the last 5 years in the nonmetallic minerals industry. Received AB degree at University of Illinois.

And they should, if a business publication is to meet its obligations to the industries it serves. This close relationship of editorial and market study is fundamental to PIT AND QUARRY's policy.

A basic factor in that policy is editorial writing that originates IN THE FIELD . . . personal "on-the-spot" contact with producers and operations. Equally basic and equally important is the preparation of market analyses developed from FIELD study of equipment in action, product applications, and potentials.

Who benefits? The READER . . . from detailed first-hand reporting on non-metallic mineral production methods in plants of all sizes. The ADVERTISER . . . who knows this readership is getting the attention it deserves . . . and who can rely on studies made from DIRECT contact by PIT AND QUARRY's staff with his product's application, markets and trends.

It is teamwork like this . . . good editorial and field research . . . that accounts for PIT AND QUARRY's years of sustained editorial leadership.



AD-GAGE reports Reader Response to Advertising and Editorial in —

PIT and QUARRY

431 South Dearborn St., Chicago 5, Ill.

BPA · READERSHIP Eastman RESEARCH · NBP

PIT AND QUARRY • PIT AND QUARRY HANDBOOK AND PREFILED CATALOG • MODERN CONCRETE • CONCRETE INDUSTRIES YEARBOOK • EQUIPMENT DISTRIBUTORS DIGEST

Enter 245 on card, page 239 →

Two Macks—one driver. One truck is on the move while the other is being loaded, for fast cycle operation from quarry to crusher.

"Our MACKS guarantee our production"

"Our stone-crushing operation is automatic, and to get full use out of it, we need trucks that can maintain a tight production schedule," reports Mr. Alexis Dyer who, with his brother Frank, owns and operates a 300-acre stone quarry near Reisterstown, Maryland. "And believe me, our 2 Mack LRX dumpers have done it, in spite of the rugged terrain they have to cover from loading to dumping."

The Dyers' Macks are loaded at the far end of the quarry with a 17 or 18 ton load. Then they cross the rocky, pock-marked bottom of the quarry, plowing their way through waterholes two feet deep, and climb a steep quarter-mile grade to the crusher.

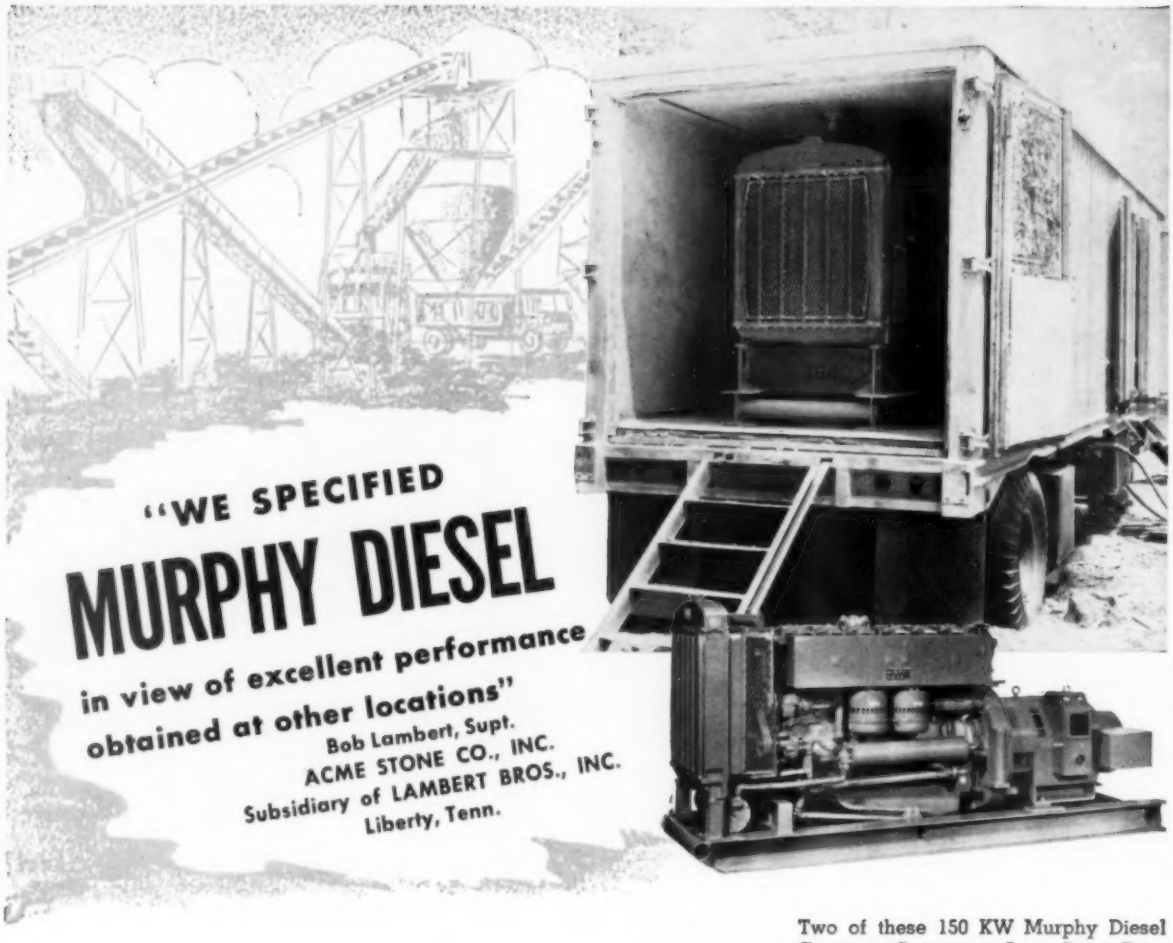
The ability to maintain a tight schedule over this jarring terrain would be a harsh test for any truck. In fact, the Dyers' previous trucks broke down frequently, seriously handicapping their output. Now, with their Macks, the Dyers experience no trouble maintaining their schedule. A full day's production for the two Macks averages 1500 tons, with each truck using only 15 gallons of fuel per day.

James Williams, who drives these two Macks, likes their maneuverability. "They drive very well—no trouble at all," he says. "Another thing I like is that there is much less shifting than there was on our other trucks, which means I'm much less tired at the end of the day—even though I make 80 round trips daily from the quarry to the crusher."

The Dyers are enthusiastic about their Macks and are planning to purchase another one in the near future. If you need help with a heavy hauling job, why not see your nearest Mack representative for full information. Mack Trucks, Inc., Plainfield, New Jersey. In Canada: Mack Trucks of Canada, Ltd.

MACK
first name for
TRUCKS

5268



"WE SPECIFIED

MURPHY DIESEL

in view of excellent performance obtained at other locations"

Bob Lambert, Supt.
ACME STONE CO., INC.
Subsidiary of LAMBERT BROS., INC.
Liberty, Tenn.

Two of these 150 KW Murphy Diesel Generator Sets power Acme Stone Company's entire plant, except the rolls. Operating 10 hours a day, the plant averages 2000 tons of sized road stone for relocation of State Highway 57.

In selecting power for profitable operations, Acme Stone Co. follows the lead of its parent company, Lambert Bros., Inc. Operating extensively in Tennessee and Ohio, Lambert Bros. *specifies Murphy* for generator or auxiliary power for crushing plants.

It will pay you to follow the lead of successful operators like Acme and Lambert. Ask your Murphy Diesel Dealer to show you how Murphy Diesel's economy of operation and dependability in heavy-duty service helps keep profits high and costs low.

Wherever your job is located, there's a dependable Murphy Diesel Dealer nearby. You can count on him for prompt, expert maintenance and parts service.

MURPHY DIESEL

HEAVY-DUTY POWER
for Rock Crushing

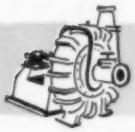
Murphy Diesel engines and power units are available in sizes from 96 to 264 H.P. with engine speeds of 1200 and 1400 rpm. "Packaged" generating units are available with capacities ranging from 64 to 165 K.W.

MURPHY DIESEL COMPANY

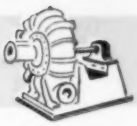
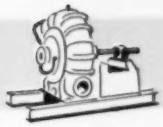
5307 W. Burnham St., Milwaukee, Wisconsin

SALES . . . PARTS . . . SERVICE
Throughout the Nation

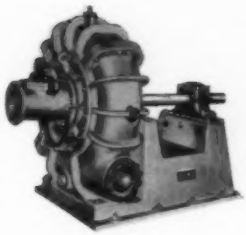
380 RO



Another Customer Speaks

"The BEST THING that has happened to me"— F. A. BURTON



BURTON GRAVEL CO.
Sand, Gravel and Cement Blocks
GRAYSVILLE, INDIANA
Telephone 25-R-15
Residence 46-R-6

February 6, 1958

Thomas Foundries
Birmingham, Alabama

Gentlemen:

I could not get prompt delivery on another Manganese Pump several years ago.

That was the best thing that has happened to me since I've been in the sand and gravel business. It caused me to buy a 10" x 8" Thomas Pump from which I have received full production with little downtime and few delays.

I had always hoped someday to have a pump I could operate a full season without major repairs. I have now found it. The Thomas Pump does it and more.

We get at least two (2) full seasons from our Thomas impellers and shell liners. This pump is a wonder.

Yours very truly,

BURTON GRAVEL COMPANY

Forest Burton

Forest A. Burton

Mr. Burton, even perhaps as you, had hoped to have some day a sand and gravel pump that would operate a full season without major repairs.

So, some five years ago he bought a Thomas Durable. Since that time, he gets at least—TWO FULL SEASONS from his Thomas impellers and shell liners!

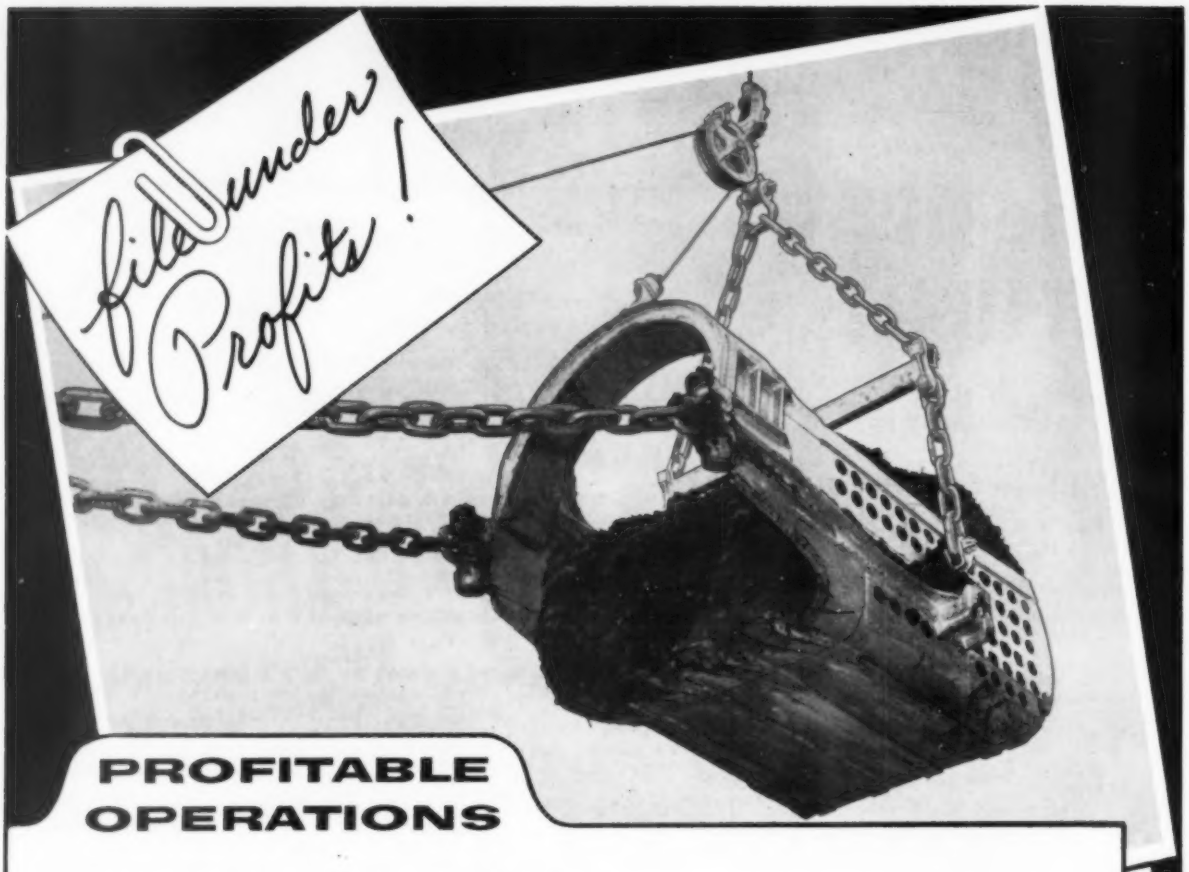
Mr. Burton's experience is not exceptional. That's the kind of service Thomas Pumps generally render, in comparison with other make of pumps. Hundreds of sand and gravel producers now have had the same experience, which proves:

"YOU CAN NOT BUY AT ANY PRICE, A MORE DURABLE PUMP FOR SAND AND GRAVEL—YOU CAN NOT BUY ANOTHER PUMP THAT WILL MAKE YOU AS MUCH MONEY"

Thomas Pumps Available In Sizes 6" through 16"

THOMAS FOUNDRIES, *Inc.*

P. O. BOX 1111 . . . . BIRMINGHAM, ALABAMA



PROFITABLE OPERATIONS

Throughout the industry Hendrix Dragline Buckets are reducing maintenance costs, because they're built to last longer. It's this *extra service* from Hendrix Buckets that makes the big difference in profitable operations!

HENDRIX
DRAGLINE BUCKETS

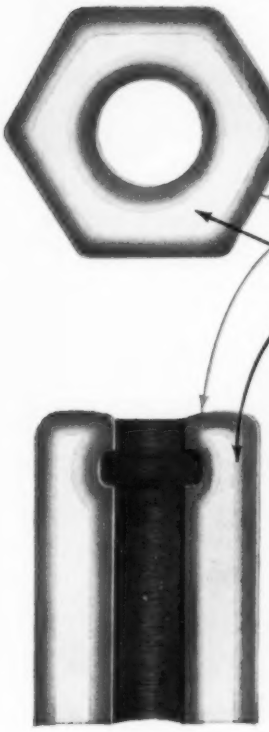
"A Type for Every Digging Purpose"...
¼ to 40 Cubic Yards-Perforated or Solid

Hendrix Lightweight Dragline Buckets

HENDRIX MANUFACTURING CO., Inc.
MANSFIELD, LOUISIANA

GARDNER-DENVER DRILL STEEL

Cuts drilling costs...reduces steel breakage



Made like tough rock drill parts

Gardner-Denver sectional drill steel is carburized to produce the same hard case, soft core structure that produces superior rock drill parts. Shot-peening increases fatigue resistance.

High-tensile surface strength resists abrasion, corrosion, nicking and down-the-hole gaff.

Tough, soft core provides compressive strength to withstand shock loads without breaking.

Made from quality steel

Gardner-Denver uses special alloy steels to insure uniform hardening and longer service life.

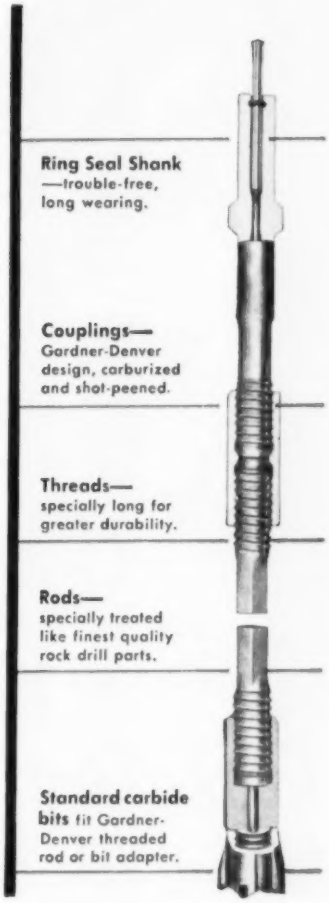
Threads and couplings designed for the job

The extra long threads and couplings of Gardner-Denver design provide greater strength and durability. Couplings are also carburized to provide a hard surface on the threads and a tough core.

Proved on the job

One user drilling hard rhyolite reports steel breakage reduced by 45% after changing over to Gardner-Denver drill steel.

Drill steel represents a large percentage of drilling costs. Gardner-Denver drill steel costs less to use. Write for information.


Ring Seal Shank —trouble-free, long wearing.
Couplings— Gardner-Denver design, carburized and shot-peened.
Threads— specially long for greater durability.
Rods— specially treated like finest quality rock drill parts.
Standard carbide bits fit Gardner-Denver threaded rod or bit adapter.

Gardner-Denver Sectional Drill Rod Specifications

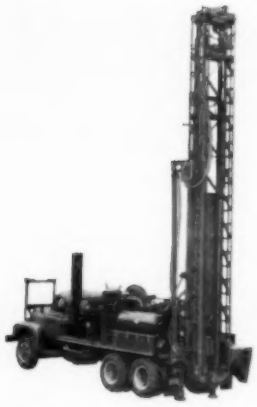
	CL5-200 Series	CL5-400 Series	CL5-600 Series	CL5-700 Series	CL5-1000 Series
Thread Size	1 1/16"	1 1/4"	1 1/2"	1 3/4"	2 1/2"
Recommended Drill Size	3" and smaller	4" and smaller	4" and 4 1/2"	4" and 4 1/2"	5 1/2"
Recommended Bit Size	1 5/8" to 1 7/8"	2" to 2 1/4"	2 3/8" to 2 3/4"	3" to 4"	4", 4 1/2" and 5"
Rod Sizes	7/8" Hex.	1" Hex.	1 1/4" Hex.	1 1/4" and 1 1/2" Hex.	1 7/8" Hex.
Rod Lengths	2' to 20'	2' to 20'	2' to 20'	2' to 20'	4' to 20'
Coupling Diameter	1 7/16"	1 3/4"	2 1/8"	2 1/2"	3 3/8"
Ring Seal Shank	1" Hex. Collared 1 1/4" Rd. Lugged	1 1/4" Rd. Lugged 1 1/2" Rd. Lugged	1 1/4" Rd. Lugged 1 1/2" Rd. Lugged	1 1/2" Round	2 1/2" Round

ENGINEERING FORESIGHT—PROVED ON THE JOB
IN GENERAL INDUSTRY, CONSTRUCTION, PETROLEUM AND MINING

GARDNER-DENVER

Gardner-Denver Company, Quincy, Illinois

In Canada: Gardner-Denver Company (Canada), Ltd., 14 Curity Ave., Toronto 16, Ontario



Rotatool for bottom-hole drilling fits all Schramm Rotadrills—Truck, Crawler or Pneumatractor mounted—past, present or future models—without affecting their uses as rotary drills.

NEW SCHRAMM

Rotatool

Bottom-hole drilling in hard rock up to 35 ft./hour

Here's the fastest-drilling tool you've ever seen for making hole in hard rock. Penetration rates vary with the rock, but average rates for the Schramm Rotatool are 15-20 feet per hour in hard rock and 25-30 feet in hard limestone. Reason: Rotatool combines the crushing power of a rock drill with the speed and efficiency of a rotary drill to give you a bottom-hole percussion tool to produce maximum fracturing action.

Rotatools are available in two sizes: The larger, for Truck and Crawler Mounted Rotadrills, takes 6″ and 6½″ bits and requires 350 cfm of air @ 100 psi. The smaller, for Pneumatractor Mounted Rotadrills, takes a 4½″ bit and requires 100 cfm @ 100 psi.

Heavier hammer delivers more crushing energy per blow for better breakage, faster penetration.

Full force of tool at bottom of the hole—none lost through drill pipe.

Instant impact delivered to the bit for greater power—makes fast, deep holes where many drills are stopped.

Clears hole of cuttings and/or water by passing full capacity of compressor plus stored air through the end of the bit . . . not restricted as in other tools.

Straighter, cleaner holes.

Full information about the Schramm Rotatool is contained in the New Bulletin SRT-58. Write for your copy today.

See the Yellow Pages for local Sales, Service and Rental of Schramm Air Compressors.

Schramm, Inc.

MANUFACTURERS OF AIR COMPRESSORS

640 N. Garfield Ave. • West Chester, Pa.

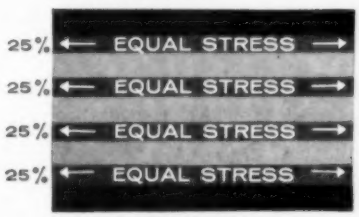
BBC – Balanced Belt Construction — is BOSTON'S exclusive manufacturing method that equalizes ply stress so that each ply pulls its full share of the load . . . eliminates lazy plies.

This is the result of two advanced BOSTON processes; *Electro-Tensile Control*, which controls ply tension — and *Rotocure*, the only continuous method of vulcanization which assures uniformity throughout the belt.

New DULON Covers add further uniformity and durability to BOSTON belts. With DULON, the consistency of belt performance has been greatly increased. DULON has proven, on the job, that it is amazingly resistant to abrasion, gouging and tearing.

Let the BOSTON man present the dramatic proof about Balanced Belt Construction with DULON Covers — as it applies to your specific belt problems.

CONVENTIONAL BELT CONSTRUCTION

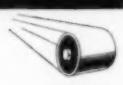


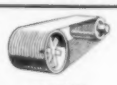
BBC-BALANCED BELT CONSTRUCTION

BOSTON

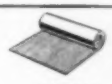
BOSTON WOVEN HOSE & RUBBER COMPANY
DIV. OF AMERICAN BILTRITE RUBBER CO., INC.
BOSTON 3, MASS.

INDUSTRIAL HOSE

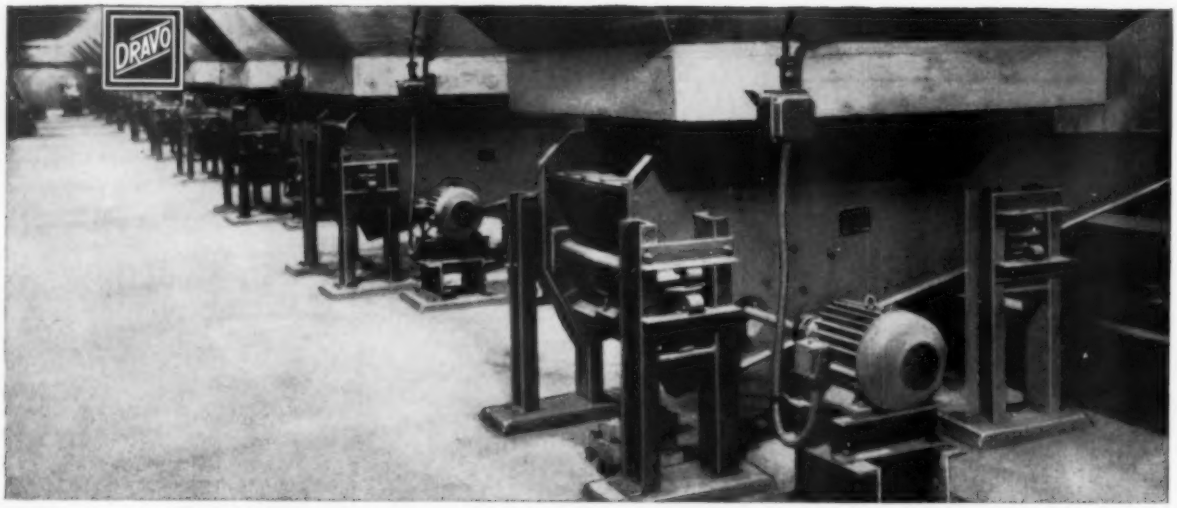

BELTING


V-BELTS

PACKING


MATTING

TAPE



Low maintenance, economical operation with DRAVO-SCHENCK vibrating screens, conveyors, feeders

Low maintenance is the keynote of Dravo-Schenck equipment. In typical installations like the row of feeders shown here, repair and replacement is held to a minimum.

The reason for such economical operation is found in the precision design of the unique "Micro-Thrust" exciter unit which reduces wear by moving material with minimum contact with troughs or screens, and the rugged construction of all wearing parts.

These heavy duty screens, conveyors and feeders are at work in a wide variety of applications—handling ferrous and non-ferrous ores, sinter, chemicals, cement clinker, crushed stone, coal and other abrasive or hard-to-handle materials.

Our engineers will gladly work with you on specific problems or write for Bulletin No. 1475, Dravo Corporation, Pittsburgh 22, Penna.

DRAVO
CORPORATION

Enter 252-A on card, page 239

LEVER-TYPE JAW CRUSHER STILL IN USE AFTER 36 YEARS
—at Keystone, So. Dakota

RELIANCE HEAVY-DUTY CRUSHER

- Heavier, stable—you save money on upkeep.
- Minimum abrasion — outlasts other designs 3 to 1.
- Long jaw plates — adjustable for fineness.
- Crushing, screening and washing plants—50 to 1,500 tons-per-day capacity—engineered to your needs.

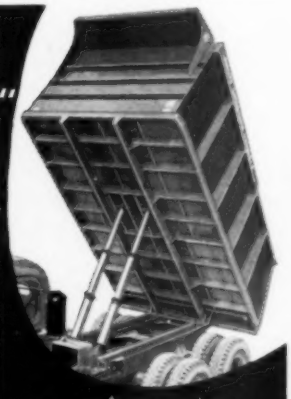
Booklet on request, pictures installations.

UNIVERSAL ROAD MACHINERY CO.
Main office and factory: Kingston, N. Y.
New York City office: 117 Liberty St.

Enter 252-B on card, page 239

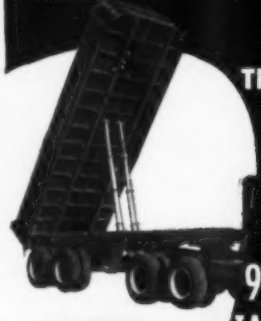
PRESS "TRIPLE TAPERED" DUMP BODY

Designed primarily for handling sand and gravel, this new Press Dump Body features a 3 taper design which allows for greater load on the front end to take advantage of strict weight laws in various states. Press quality construction assures low maintenance cost — more yardage moved at lower cost. Get the facts today on Press Dump Bodies — Write for descriptive literature.



PRESS TRAILER DUMP BODY

Designed to carry extra payload because of Press quality construction. Whatever your body requirements—you will find all of the facilities to build these bodies at Jacob Press' Sons. Before you buy your next body, write Press for quotation.



99 YEARS OF QUALITY BODY BUILDING

JACOB PRESS' SONS, inc.

SINCE 1859

3302 S. NORMAL AVE. • CHICAGO 16, ILL.

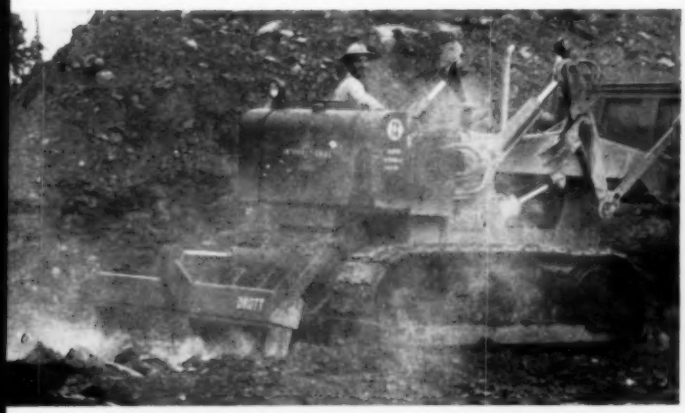
Enter 252-C on card, page 239

Enter 253 on card, page 239 →

By depth-controlled, straight-forward bucket-fill — using International Drott TD-14 4-In-1 Skid-Shovel action—La-Lite Company, Brickville, Tennessee, speeds removal of overburden from shale rock strata, avoids rehandling cost. And 4-In-1 bulldozer action starts rolling dirt, instantly, at a fingertip touch!

TD-14 4-in-1 uncovers, scarifies, stockpiles and loads shale efficiently

...for Tennessee Aggregate Producer



Shale-shattering action with the International Drott Scarifier attachment saves La-Lite Company the cost of breaking-up shale deposits by drilling. The third valve, standard equipment on all International Drott outfits, provides scarifier control power.

In addition to the actions shown, the 4-In-1 also gives instantly-available, big-capacity clamshell, and carry-type scraper performance. Prove what it means to get 4-machine utility for one moderate price. Ask your International Drott Distributor for a 4-In-1 demonstration!

Takes only one minute for the TD-14 to heap-load a 6-ton truck with shale—which La-Lite Company wholesales as aggregate to building block manufacturers. Versatile performance has enabled the 4-In-1 to replace a ¾-yard shovel on this owner's operation!

Send for free catalog today

Gentlemen: My material handling operation consists of (please name): _____

_____

Please send 4-In-1 catalog literature checked:

☐ 1-yd TD-6 (CR-612G) ☐ 1½-yd TD-9 (CR-648G) ☐ 2¼-yd TD-14 (CR-642G)

Name _____

City _____ State _____

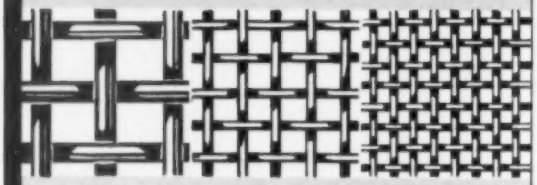
Street or R.F.D. _____

International Harvester Company, Chicago 1, Illinois
Drott Manufacturing Corp., Milwaukee 15, Wisconsin

INTERNATIONAL HARVESTER

INTERNATIONAL® DROTT®

STRONG AS ARMOR
NAT-ALOY
Woven Wire Screens



Reliable Nat-Aloy woven wire cloth is specified throughout industry for maximum screening accuracy and economy. Available in flat surface, lock crimp, double crimp, rectangular and long slot openings. All sizes, meshes and gauges—prompt shipment.

WE OFFER NOW...SUPER NAT-ALOY
OIL TEMPERED WOVEN WIRE CLOTH
★ GREATER RESISTANCE TO ABRASION
★ MORE TONNAGE AT LOWER COST
★ FEWER COSTLY CHANGE OVERS

Write for information. Also stainless steel wire screens.

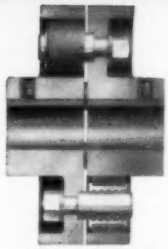
NATIONAL WIRE CLOTH COMPANY
252 W. Fairfield Ave., St. Paul 1, Minnesota

Enter 254-A on card, page 239

It pays to Specify
AJAX
The World's Most Complete Line of
FLEXIBLE COUPLINGS

AJAX DIHEDRAL COUPLINGS

AJAX Patented Dihedral tooth shape handles angular and offset misalignment up to 12 degrees.



AJAX RUBBER-BRONZE CUSHIONED COUPLINGS

Safeguard your machines against costly shutdowns. Standard of industry for 37 years. All types and sizes.

Write for Ajax Technical Catalogs. Representatives from coast to coast.

AJAX FLEXIBLE COUPLING CO. INC.
WESTFIELD, NEW YORK
Also manufacturers of Ajax vibrating conveyors, screens and packers.

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NOW
U.S. SAVINGS BONDS
PAY YOU HIGHER INTEREST
FASTER!

PART OF EVERY AMERICAN'S SAVINGS
BELONGS IN U. S. SAVINGS BONDS

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"MARCY kept us in business"

says George Wagner, Superintendent

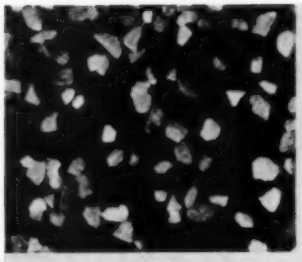
DENVER MORTAR AND MATERIALS COMPANY

now gets $2.00 a yard out of waste gravel

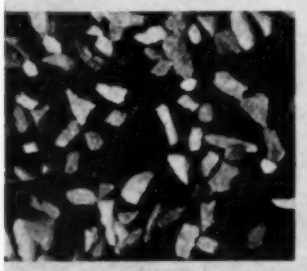
About 6 years ago the company management thought they would have to go out of business. The sand deposit was running over 50% pea gravel for which there was a very limited market ...and they were lucky to get 25c a yard for it. This condition also presented a serious stockpiling problem.

Then they bought a 3′ x 6′ Marcy Rod Mill. Screening at 6 mesh results in approximately equal quantities of plus and minus 6-mesh products. One pass through the rod mill reduces the pea gravel to the desired size for plaster and masonry sand.

George Wagner, Superintendent, says: "The Marcy Mill makes a better product, cleaner and sharper than the natural sand. Now we get $2.00 a yard, wholesale, instead of nothing, out of half of our pit material. The Marcy mill kept us in business."



MARCY CPD MILL PRODUCT



CRUSHER PRODUCT

COMPARISON OF MARCY MILL AND CRUSHER PRODUCTS

Identical rock samples were put through a crusher and a Marcy CPD Mill. The resulting products, screened to −10 +14 mesh, are shown above. Note the elongated shape and sharp, weak edges of the crushed product compared with the uniformly cubical Marcy Mill product.

For complete information on the many advantages of grinding sand with Marcy Rod Mills—

The Mine & Smelter Supply Co.

Denver • Salt Lake City • El Paso • New York

Representatives in Foreign Countries

WRITE FOR CATALOG

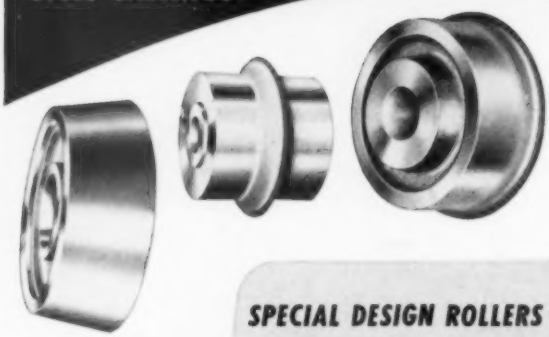
SPECIALISTS IN GRINDING FOR FORTY YEARS

A Wheel or Roller for Every Need!

ENGINEERED FOR YOU BY

FARRELL -CHEEK

F 85, HARD EDGE ALLOY AND CARBON ELECTRIC FURNACE STEEL CASTINGS



SPECIAL DESIGN ROLLERS
SINGLE FLANGE WHEELS
DOUBLE FLANGE WHEELS
CRANE WHEELS
CONVEYOR ROLLERS
INDUSTRIAL CAR WHEELS

Extreme Resistance to

✓ SHOCK
✓ WEAR
✓ ABRASION

DOWNTIME REDUCED TO A MINIMUM!

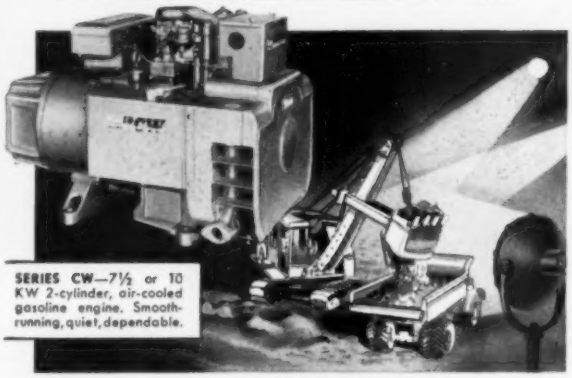
WRITE TODAY FOR CATALOG NO. 24

FARRELL-CHEEK STEEL COMPANY
SANDUSKY, OHIO, U.S.A.

BUCKETS • SPROCKETS • CHAIN • WHEELS • GEARS • SHEAVES • CABLE FITTINGS • BAR BENDERS, CUTTERS • R. R. CASTINGS • FIRE TOOLS, ETC.

Enter 256-A on card, page 239

ELECTRIC PLANT NEWS



SERIES CW—7½ or 10 KW 2-cylinder, air-cooled gasoline engine. Smooth-running, quiet, dependable.

Large-area floodlighting steps up safety, efficiency

High capacity, easily portable Onan Electric Plants give you big advantages for night lighting pit operations. Easily moved from job to job and from place to place on the site itself, Onan portable units have the capacity to light not only the work face, but approaches, job offices, ramps and dumps. Can be used to power motor-driven equipment and communications too. *Air-cooled models from 500 to 10,000 watts. Water-cooled 10 to 75KW. Air-cooled Diesel electric plants: 3,000 and 5,000 watts.*

Write for Folder of Portable Models

D. W. ONAN & SONS INC.

3556A University Ave. S. E., Minneapolis 14, Minnesota

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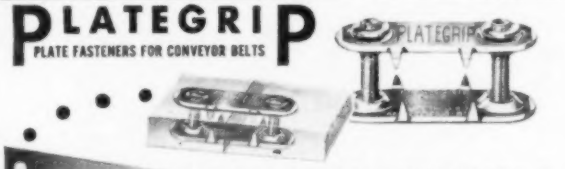
PLATEGRIP
PLATE FASTENERS FOR CONVEYOR BELTS



Make strong dust-tight, water-tight joints in belts of any width. Special design spreads tension uniformly across belt, allow natural troughing of belt and assures smooth operation over flat, crowned or take-up pulleys. Sizes for belts of from ¼" to 1½" thickness. *Write for Catalog Sheet.*

ARMSTRONG BRAY & CO.
5394 Northwest Highway, CHICAGO 30, U. S. A.

Enter 256-C on card, page 239

DEPENDABLE FOR 60 YEARS

Woven Wire ALLOY SCREENS

TWIN CITY IRON & WIRE CO.
St. Paul, Minnesota

Enter 256-D on card, page 239

ONE GREASE...ONE GUN CUTS INVENTORY...FROM 3 TO 1

Don't bother with 3 different greases — chassis, wheel bearing and water pump! Sinclair LITHOLINE® Multi-Purpose Grease does the job of all 3 . . . does away with the need for separate pieces of lubrication equipment.

Thanks to LITHOLINE, you use just one grease, one gun — cut inventory from 3 to 1. No danger of misapplication or contamination. You'll discover that LITHOLINE lengthens lube intervals, prolongs equipment life. It saves you time, trouble and money.

A Sinclair Lubrication Engineer will be glad to show you how Sinclair LITHOLINE Multi-Purpose Grease can help you get the most out of *your* equipment. Call your nearest Sinclair Representative, or write Sinclair Refining Company, Technical Service Division, 600 Fifth Avenue, N. Y. 20, N. Y. *There's no obligation.*

SINCLAIR LITHOLINE®

MULTI-PURPOSE GREASE

HOW TO BOOST DOZER PRODUCTION AS MUCH AS 50%

It's a fact — under many conditions, dozer production can be boosted as much as 50% simply by installing Preco Back-Rippers! You convert deadhead time into productive time by ripping as you back. And ripping loosens packed clay, shale, rock, overburden, or other hard materials so that you do a smoother, faster, dozing job, and get a full load with less power.

There's a size of Preco Back-Ripper to suit your needs — available for all sizes and types of bulldozers . . . straight, angling or U-dozers.

So, if you'd like to make your present tractor produce like the next size larger, see your Preco-Caterpillar Dealer today! Name the date for a demonstration. For literature, write Dept. 58, Preco Incorporated, 6300 East Slauson Ave., Los Angeles 22, California.

PRECO®

BACK-RIPPERS
AUTOMATIC BLADE CONTROLS

Enter 258-A on card, page 239

Check JOHNSON wide-rehandling clamshells

All-welded, smooth, fast-cleaning

Light-weight, sturdy, Johnson wide-rehandling clamshells assure big payload performance in loose materials. Big-diameter sheaves, with sealed-in needle bearings, reduce friction loss, deliver full digging power to the cutting lips. Hard manganese cutting edge, welded to lips, toughens with use. Wide-rehandling clamshell is available in 10 sizes from ⅜ to 3 cu. yds. Other clamshells in Johnson line include general-purpose, and heavy-duty-digging types.

mail to: **C. S. JOHNSON CO.,** CHAMPAIGN, ILLINOIS *(Koehring Subsidiary)*

Send more information on_____ cu. yd. wide-rehandling clamshell bucket

NAME_____

COMPANY_____

STREET_____

CITY, STATE_____ J 418 PQ

Enter 258-B on card, page 239

LOW COST POWER
For Fast "Secondary Breakage"

FREDERICK *CAST SEMI-STEEL* DROP BALLS

Tough, rugged Frederick Drop Balls give you crushing power where you want it, when you want it . . . cut down expensive drilling or blasting . . . give long, economical service with little or no maintenance. Exclusive "Pear shaped" design withstands greater impact—drops straighter. "E-Z Swing" recessed steel eye gives cable protection plus free swinging action. Use Frederick Cable Weights (135 & 250 lbs.) and Frederick Swivels on all size balls for true, safe cable performance. Nickel alloy standard on all 4000 lbs. or over—or special alloys furnished on request. Balls can be furnished with replaceable pins. Special release hooks for free dropping also available.

Write us today for prices and illustrated literature. Order Balls direct or see your nearest Equipment Dealer.

Wide range of sizes and weights:

Pear shape (lbs.)	1500	2000	3300	4000	5200	6500	8000	10,000
Ball shape (lbs.)	500	1000	2000	5200				
Spherical shape (lbs.) (for magnet use)	470	950	1650	2400	3000	3700	5400	6900

FREDERICK IRON & STEEL, INC.
FREDERICK *Established 1890* MARYLAND
Phone: MOnument 3-5111

CENTRIFUGAL PUMPS • MUNICIPAL AND GRAY IRON CASTINGS

Enter 258-C on card, page 239

Enter 259 on card, page 239 →

Marion 111-M Does Double Duty

A Marion 111-M is "doing a good job on two jobs" at a Texas sand and gravel plant.

Half of its job is to handle the stripping to keep the sand and gravel bank uncovered.

Then it handles all of the loading for a plant that is working two shifts to keep pace with expanded operations.

The Marion 111-M is equipped with a 5-yard bucket on a 90-foot boom, making it one of the biggest machines in this type of work in the Texas area.

The 111-M is a diesel machine, capable of traveling and working almost anywhere. It combines all of the advantages of a diesel machine with the smooth, fast swing action of Ward-Leonard electric control. The diesel power unit drives a generator for the electric swing motors; there are no swing clutches to overheat and no complicated maintenance problem.

Get the complete story on the Marion 111-M and the tough jobs it is handling throughout the world. Your nearest Marion Distributor is the man to see.

Whatever your job requirement, there is a Marion machine of the right size and type for greatest efficiency

MACHINE	Shovel Capacity	AVAILABLE AS . . .			
		Hoe	Crawler Crane	Truck Crane	Special Crane
35-M	¾	Yes	Yes	Yes	—
43-M	1	Yes	Yes	Yes	—
362	1½	Yes	Yes	—	Yes
87-M	—	—	Yes	—	Yes
93-M	2½	Yes	Yes	—	Yes
101-M	3	—	Yes	—	—
111-M	4	—	Yes	—	—

MARION **POWER SHOVEL COMPANY**
A Division of Universal Marion Corporation
Marion, Ohio

SEND ME information about **MARION** ..... yard shovels, ... yard hoes and ..... ton cranes (☐ crawler mounted ☐ truck mounted). ☐ Have a salesman call.

NAME ..... TITLE .....

COMPANY .....

STREET .....

CITY ..... ZONE ..... STATE .....

when the stone comes tumbling down...

HENDRICK PERFORATED PLATE STANDS UP!

Hendrick H Quality Steel Plate stands up under the toughest, heavy-duty screening of crushed stone. It's made from high carbon or stainless steels. High carbon can be heat-treated after perforation for longer life. It screens faster and easier, while full openings eliminate blinding. Product uniformity is assured throughout the life of the screen. Deck changes are quick, for lowered labor costs.

Hendrick H. Quality Steel Perforated Plate is available either flat, corrugated or stepped, in any desired shape, and with perforations of any size.

HENDRICK MANUFACTURING COMPANY
39 Dundaff Street Carbondale, Pa.

Perforated Metal • Perforated Metal Screens • Wedge-Slot Screens • Hendrick Wedge Wire Screens • Architectural Grilles • Mitco Pan Steel Flooring
Shur-Site Treads • Armorgrids • Hydro Dehazers • Distillation Column Internals

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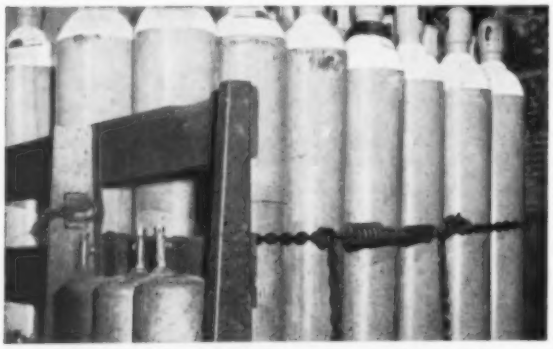

LEBUS Snubbing Load Binder secures "SOLID" loads!

Solid loads—gas cylinders, rod cans, pipe, steel, stone, etc., stay put on your truck when they're secured with Lebus Snubbing Load Binders. Re-tightening of chain after load has settled isn't necessary. Rugged coil spring absorbs shocks—maintains full binding tension—dropping back a link is never required! Short throw handle ideal in confined areas. Many features—drop forged binder, ball and socket swivel, locking handle—make Lebus Load Binders first choice of profit-safety conscious truckers. See, *test* this popular binder at mill supply, industrial or construction equipment distributors everywhere. For help with your binding problem, write:

CROSBY-LAUGHLIN *Division*
AMERICAN HOIST & DERRICK COMPANY
FT. WAYNE 1, INDIANA

Enter 260-B on card, page 239

CRUSHER JAWS

Excellent condition. Available for immediate delivery. For use in Diamond Type 30 Primary Crusher and Cedar Rapids Model 3420.

Qnty.	Mfgr.	Description	Part No.
17	Diamond	Stationary Straight	13216
17	Diamond	Movable Straight	13217
17	Cedar Rapids	Stationary	3420
17	Cedar Rapids	Movable	3240A26

Weight: 5800 lbs. each Priced for quick sale.

PECK EQUIPMENT COMPANY
P. O. BOX 886 • PORTSMOUTH, VA. • PHONE EXPORT 7-5873

Enter 260-C on card, page 239

CONTRACT CORE DRILLING

EXPLORATION FOR MINERAL DEPOSITS
INCLUDING URANIUM & LIMESTONE — ANYWHERE

FOUNDATION TEST BORING

GROUT HOLE DRILLING

Skilled crews and complete stock of core drills and accessory equipment maintained at all times

Core Drill Contractors for more than 60 years

JOY MANUFACTURING CO.
Contract Core Drill Division
MICHIGAN CITY, INDIANA

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Advertising rate per issue:

$10.50 per column inch. Lower rates for larger space used and/or on a contract basis.

Write for rate card.

Closing date:

20th of month preceding date of publication.

PIT & QUARRY
431 S. Dearborn St. Chicago 5, Ill.

BROADCAST

Section

Driller—Powderman Wanted

Crushed Stone quarry in Southern California Wagon drilling and springing operation. Write giving details of experience, education and salary desired. Replies confidential.

Box No. PQ-101-E
c/o Pit & Quarry Publications
431 So. Dearborn St.
Chicago 5, Ill.

PLANT ENGINEER WANTED

LARGE MID-WEST CEMENT PLANT NEEDS ENGINEER WITH MECHANICAL, CIVIL OR CHEMICAL ENGINEERING BACKGROUND.

CEMENT PLANT EXPERIENCE DESIRABLE BUT NOT NECESSARY.

WRITE GIVING DETAILS OF EDUCATION, EXPERIENCE AND SALARY DESIRED.

REPLIES STRICTLY CONFIDENTIAL.

Address Replies To:

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431 So. Dearborn St. Chicago 5, Ill.

SUPERINTENDENT WANTED IN SOUTH-WESTERN ONTARIO

Should have basic mining or mechanical engineering education or equivalent in actual experience in the operation of open pit limestone or similar type quarry. Should have intimate knowledge of extraction and processing of limestone to multi-size aggregates and be able to operate at a cost figure that would keep the company on better than equal footing in a highly competitive market. Ability to handle personnel also required. Salary to be commensurate with ability and experience.

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HELP WANTED

Permanent position with unlimited opportunity for advancement for explosive expert for rotary drill manufacturer. Should be familiar with Mid-West states.

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Crushed Stone Quarry in Chicago Area. Write, Giving Complete Details of Experience and Salary Desired.

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MASTER MECHANIC

Crushed Stone Quarry in Chicago Area. Write, Giving Complete Details of Experience, Education and Salary Earned.

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POSITION WANTED

EXPANDED AGGREGATES EXECUTIVE intimately familiar with all phases of fast growing expanded shale, clay and slate industry. 10 years experience in research, development, marketing, exploration, plant lay-out, production and concrete products. Capable, management minded, graduate engineer seeks challenge with growth potential. Replies confidential.

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WANTED TO BUY FOR CASH ESTABLISHED QUARRY AND CRUSHED STONE BUSINESS

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We look into the earth
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Specializing in Quarry Blast Holes using
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BULK MATERIALS HANDLING
SPECIALISTS IN DESIGN OF CRUSHED STONE, SAND, GRAVEL AND READY-MIX PLANTS
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Construction
Design
Operation
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Appraisals

MODERN STONE CRUSHING PLANT: Complete with 25x40 roller bearing Jaw Crusher, two 36" and one 24" Cone Crushers, 4x8, 3-deck Screens, Belt Conveyors, Apron Feeders, Truck Scale. Magnetic pulley, all motors, controls, with or without trucks and shovels.

CLASSIFIERS: 4 Wemco and 2—Akins 78" duplex spiral with tanks 36' 6". All complete, new condition.

ROTARY KILNS & DRYERS: 4½' x 40 ft., 5 ft. x 50 ft. and 8 ft. x 40 ft. Rotary Kilns, all modern, gas fired, complete with all equipment, including instruments and controls. One 9 ft. x 120 ft. Two 8 ft. x 125 ft. Two Ruggles Coles Dryers class XA18, 104" dia. x 65 ft., new condition. One Ruggles Coles class XH12, 80" x 60 ft., new 1955. One 6' x 50 ft. Rotary steam Dryer and one 6' x 50 ft. rotary Cooler. One Kiln 10' dia. x 210 ft., ¾" plate.

PULVERIZERS: Hardinge Conical Ball Mills—8 x 36, 8 x 48, 10 x 48, with 200, 250 and 350 H.P. synchronous motors. One 6' 6" x 21 ft. Tube Mill, stone lined with or without synchro motor and controls.

SYNCHRONOUS MOTOR: 900 H.P., 180 RPM, 2300 volts, complete, new 1957, like new.

AIR SEPARATORS: Sturtevant 16 ft.

JAW CRUSHERS: 10 x 15, 10 x 20, 12 x 24, 15 x 36, 24 x 36, 25 x 40, 30 x 42 and 40 x 42". One 18 x 30 and one 24 x 72 sectionalized for underground use.

LOCOMOTIVES: One 98 ton diesel electric Switcher, 900 H.P. One 80 ton diesel electric with Cummins diesel motors and G.E. electrics. One 35 ton and one 25 ton diesel electric. One 20 ton diesel. One 16 ton gasoline. One 10 ton diesel. All standard railroad gauge.

MINE HOISTS: One 10' dia., 10' face, double clutched drums, 1250 H.P., 1⅛" rope, 1200 FPM, complete with all controls, excellent condition. Other hoists 100 H.P. to 2500 H.P.

CLAM SHELL BUCKET: Williams 1¼ yd. capacity, excellent condition.

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THROUGHOUT
NORTH AND CENTRAL AMERICA

A. J. O'NEILL
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MINING EXECUTIVE

With broad experience in executive and management positions, including production and exploration. Experienced with modern trackless and standard mining methods. Competent administrator and organizer. Exceptionally qualified for performance and leadership. Presently employed. Desires new position in non-metallics or industrial minerals.

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For Sale by Owner
Located at St. Cloud, Minn.

1—Bucyrus-Erie # 12 Bit dresser
1—Oil burning forging furnace
1—Oil burning tempering furnace
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1—Drill stem, 6½" x 20', 3¼ x 4¼ 7API
1—Fishing tool
15—Special drill bits, 9"—3¼ x 4¼ 7API
1—16" Allis-Chalmers Superior McCully Crusher

As is and where is, subject to prior sale.

SHIELY-PETTERS CRUSHED STONE COMPANY
St. Cloud, Minnesota Blackburn 1-7141

SCRAP YARD EQUIPMENT

Alligator shears to cut scrap. Magnets, all sizes guaranteed. Cranes, Koehring 304 Crawler; Truck Crane, 12½ ton tandem. Dempster Dumpsters; Butane tanks, 25,000 gallon.

H. GREENBERG
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FOR SALE
USED CONVEYOR BELTING
54" WIDE
7 PLY AND BREAKER PLY
3/16" x 3/32" covers
LINCOLN MACHINERY
2425 E. 118 Ph. LO 6-6128
LOS ANGELES 59, CALIF.

WANTED

Someone to quarry, large hard blue lime stone deposit, tests 94, located in a good farm area, small over burden. Sell royalty reasonable. If interested write:

GEORGE J. MILLER
843 S. MacArthur Springfield, Illinois

FOR SALE

CRUSHING AND MILLING EQUIPMENT
Located in New Jersey

GYRATORY CRUSHER
Allis Chalmers 8-K, with spare shaft, mandrel, gears, etc.

TRAYLOR ROLL CRUSHER
Smooth rolls, size 30" x 16" face.

SUPERIOR ROLL CRUSHERS (2)
Smooth rolls, size 36" diameter x 16" face; each roll separately motor driven, with 2 spare rolls and other spare parts.

MARCY ROD MILL
Size 3' x 6', with scoop feed, overflow discharge.

SCHRAMM AIR COMPRESSOR
Model 315, stationary with receiver.

SLIP RING MOTOR, 200 H.P., 600 RPM
Allis Chalmers Vent-type for dusty location.

USED CONVEYOR CHAIN
#4103 Pintle chain—1000'
103 Hook chain—1200'
12" pitch roller chain—1000'

75' PAN TYPE ELEVATORS (3)
On roller chain with 25 H.P. motors.

WRITE OR PHONE

L. J. LAND, INC.
P.O. BOX 756 READING, PA.
FRANKLIN 4-4953

FOR SALE

One 34E dual drum Koehring paver in good condition $12,000
Two two cu. yd. Smith mixers. Each..... 250
One 28' by 66" Asphalt dryer 3,500
One Clarage #137 fan used only 250 hours (64" wheel) 1,800
One American Blower fan, 50" wheel.... 450
One American Blower high pressure blower with fluid drive and Hauck 758 combination oil and gas burner. This burner operates on #2 gas pressure. 60 hp. electric motor included 1,200

WANTED

One 4 by 10' Robbins vibrex screen with two decks
One 150 hp. electric motor at 1200 rpm. Also starter. 220 volt
One 100 hp. electric motor at 1800 rpm. Also starter. 220 volt
Jeffrey vibrator feeders capacity fifty tons to two hundred per hour.

TYLER READY-MIX CONCRETE & ASPHALT CO.
P.O. Box 1046 Tyler, Texas

VAST **SILICA SAND** DEPOSITS
- Gravel Pits • Foundry & Molding Sands
- 1700 Acres Available on Lease/Royalty Basis
- Location: Southern New Jersey

OWNER—VINELAND ASSOCIATES
85 Central Ave., Clifton, N. J.
PRescott 7-6115 (NJ)

ASPHALT PLANTS

Barber-Greene Model 840-B Multiple Aggregate Plant, complete with Mixer, hot elevator, gradation unit, dual cyclone dust collector, 2 gate reciprocating feeder, electric power. One year old—like new condition. **Located Central Kentucky.** **$37,500.00**

Barber-Greene Model 845 Asphalt Plant, complete with gradation unit. Excellent condition. **Located Central Kentucky.** **$45,000.00**

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Write—Wire or Phone
Jim Waddell
P. O. Box 1705 MElrose 7-4741
Louisville 1, Ky.

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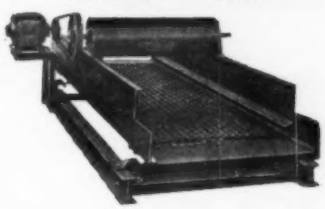
NEW CURRENT MODELS IMMEDIATE SHIPMENT FROM OUR FACTORY - WRITE, WIRE OR PHONE

NEW BONDED® GENERAL DUTY VIBRATING SCREENS



NEW BONDED® HEAVY DUTY VIBRATING SCREENS

For mineral, chemical and other industrial products. Fast, efficient and economical for cleaning, sizing, grading, dewatering. Made in all metals, including stainless steel. Enclosed models for hot materials or dust control. Bonded screens are built for any screening operation, wet or dry.

GENERAL DUTY SCREENS, TYPE A: Eccentric weight mechanism, spring mounted, 1 to 3 decks, 2' x 4' to 3' x 8'. **WRITE FOR BULL. #1086.**

Model Number	Screening Price	No. of Decks	Sale Price
124A	2'x4'	1	$ 443
224A	2'x4'	2	472
126A	2'x6'	1	472
226A	2'x6'	2	501
134A	3'x4'	1	504
234A	3'x4'	2	570
136A	3'x6'	1	581
236A	3'x6'	2	688
336A	3'x6'	3	956
138A	3'x8'	1	675
238A	3'x8'	2	815
338A	3'x8'	3	996

HEAVY DUTY MODELS, TYPE B: Four bearing positive throw eccentric shaft: 3' x 6' to 5' x 14', 1 to 5 decks. **WRITE FOR BULL. #1087.**

Model Number	Screening Area	No. of Decks	Sale Price
336B	3'x6'	3	$1620
436B	3'x6'	4	1685
138B	3'x8'	1	1510
238B	3'x8'	2	1620
338B	3'x8'	3	1735
248B	4'x8'	2	2310
348B	4'x8'	3	2440
2410B	4'x10'	2	2400
3410B	4'x10'	3	2550
2412B	4'x12'	2	2590
3412B	4'x12'	3	2970
4412B	4'x12'	4	3165

NEW BONDED® TROUGHING IDLER CONVEYOR BARGAINS

Remember, You Save Up To 50%

CONVEYOR PRICES INCLUDE BELTING

Complete Pre-Fab sections of 8" Jones & Laughlin Jr. I Beam Frame Conveyors quickly and easily joined together on the job. These beams are rolled with .20% Copper Content. Atmospheric exposure tests disclose that Junior Beams with .20% Copper have as much as four times the resistance to corrosion as non-copper steels. Braced with structural angle, welded to frame for maximum rigidity. Equipped with 5" roll diameter idlers and return rolls, 20" diameter head pulley and 16" diameter tail pulley, mounted on 2¼" or 2 7/16" diameter shaft. We take our loss on our stock of short length belting. You can save as much as 50% on BONDED CONVEYOR SPECIALS, with conveyor belting in two pieces. Belt is new 4-ply, 28 oz. duck, ⅛" top rubber cover x 1/32" bottom cover Major grade belt and is Fresh Stock made by leading manufacturers. **WRITE FOR BULLETIN #1138.**

Bonded troughing idler conveyors also available in Truss Frame Construction. **WRITE FOR BULLETIN #1189 AND PRICES.**

A full line of accessories available, including carrying and return belt covers.

Belt Width	Length of Conveyor	List Price	Sale Price	Add or Deduct Per Foot
14"	25'	$1397	$ 722	
14"	50'	2222	1144	$16.84
14"	85'	3377	1733	
16"	20'	1262	636	
16"	45'	2137	1088	18.04
16"	60'	2662	1359	
16"	90'	3712	1900	
18"	25'	1477	794	
18"	45'	2217	1166	
18"	70'	3142	1648	19.24
18"	85'	3697	1933	
18"	100'	4252	2220	
18"	130'	5362	2797	
20"	25'	1517	828	
20"	60'	2882	1533	20.37
20"	75'	3467	1838	
20"	90'	4052	2145	
24"	25'	1590	898	
24"	45'	2430	1330	
24"	70'	3480	1875	21.78
24"	100'	4740	2514	
24"	120'	5580	2950	
24"	150'	6840	3603	
30"	50'	2911	1617	24.75
30"	70'	3871	2119	
30"	90'	4831	2614	
36"	25'	1818	1118	
36"	45'	2858	1678	27.95
36"	60'	3638	2096	
36"	100'	5718	3214	

NEW CONVEYOR BELTING SAVE UP TO 30%

WE PAY FREIGHT ON 200 POUNDS OR OVER

Major Brand: 12# to 15# Average Friction Pull. 800# to 1000# Average Cover Tensile. Heavy Duty 4-ply, 28-oz. duck, ⅛" top rubber cover x 1/32" bottom rubber cover belting having high tensile strength, tough cotton duck, strong carcass and proper flexibility. For heavy boxes, bags and bulk materials. Troughs easily. Famous brands at deep cut prices. Fresh stocks.

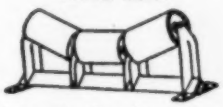
Width	Ply	List Price Per Ft.	List Price Per Ft.
14"	4	$3.63	$2.83
16"	4	4.08	2.97
18"	4	4.51	3.29
20"	4	4.97	3.80
24"	4	5.85	4.26
30"	4	7.18	5.21
36"	4	8.51	6.18

Major Bee Brand: 16# to 19# Average Friction Pull, 2500# to 3000# Average Cover Tensile. Skim coat between plies. A high grade of heavy duty 4 and 5-ply, 28 oz. duck, ⅛" top rubber cover x 1/32" bottom rubber cover. These belts are for more severe service, high tonnages and abrasion resistance. For handling stone, mineral ores, concrete, cement, coal, and other similar materials, both wet and dry. Belts have molded rubber edges.

Width	Ply	List Price Per Ft.	List Price Per Ft.
14"	4	$4.31	$3.06
16"	4	4.85	3.46
18"	4	5.39	3.83
20"	4	5.90	4.37
24"	4	6.94	4.94
30"	4	8.53	6.07
36"	4	10.09	7.35
24"	5	8.14	5.78

Other widths, plies, duck weights and cover thickness available at low prices. **WRITE FOR FREE SAMPLE AND BULLETIN #1209.**

NEW IDLERS AND RETURN ROLLS SAVE 25%



3-roll, 5" diameter Troughing Idlers for:

14" belt	$18.50	24" belt	$21.25
16" belt	19.25	30" belt	22.00
18" belt	30.50	36" belt	22.75
20" belt	20.75	48" belt	25.50

1-roll, 5" diameter Return Idlers for:

14" belt	$7.25	24" belt	$ 8.50
16" belt	7.50	30" belt	9.50
18" belt	8.00	36" belt	10.00
20" belt	8.25	48" belt	11.50

All steel. Interchangeable with other well-known makes. Furnished with replaceable prelubricated sealed ball bearings. Maintenance is negligible. **WRITE FOR BULLETIN #1138.**

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200	G.E., T.E.F.C. B.B.	K-6329	3600
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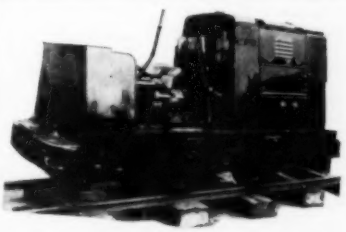

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1100	*G.E.	MT	720
1000	G.E.	M-575-S	1200
1000	*West.	CW	450
600	*G.E.	M-6345-S	1800
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400	*G.E.	MTP-565	1200
350	*Al-Ch	ARYW	1800
300	Cr-Wh	SR-70-R	1800
250	Al-Ch	ARY-626	1800
250	*G.E.	I-M-17A	720
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200	*West.	CW1950A	514
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125	G.E.	I-M-15A	600
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1750	*G.E.	K	1800
1250	*Al-Ch	ANX	3600
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600	*G.E.	K-63455	1200
500	*G.E.	K-63455	1200
500	*G.E.	I-13-E	900
350	*G.E.	KT-559-A	1800
300	*G.E.	K-6344	1200
250	*W (TE)	CS-81205	1800
250	*G.E.	KT-599-S	1800
250	*West.	CS-875-S	1800
250	Brook	RS-28	1200
200	*G.E.	FT-540	3600
200	*G.E.	I-K-13B	1800
200	West.	CSP-581-S	1800
200	Brook	RS-27	1200
200	*West.	CS-930-A	900
200	G.E.	KT-564-S	720
200	*Al-Ch	AN-37-G	720
200	*West.	CS-1010	600
200	Al-Ch	ARW-631	600
150	Cr-Wh	SC-140	3600
150	Al-Ch	AN-30-F	1200
150	West.	CSP-5815	1200
150	G.E.	I-K-15A	900
150	*West.	CS	600
125	Al-Ch	AR-226	1800
125	Cr-Wh	5-Q	1200
125	G.E.	K-558	900
100	W (TE)	CS-507-S	3600
100	G.E.	FT-542-Z	1800
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6—2 yd. McCaffrey, Mdl. DLM, heavy duty—7320#.
1½ and 2 yd. Yaun Dragline buckets—Like new.

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65 ton Whitcomb Diesel Elec. Loco.
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Concrete Plant. 4 comp Johnson bin 3 agg 1 cement This plant complete in every respect and equal to new. Capacities on agg 150 ton Cement bin 250 bbl and cement silo 600 bbl and under track hopper 400 bbl. total 1250 bbl storage cement screw and elevator one agg conveyor 24 in x 240 ft long complete 2½ yard batcher, with all dial scales one conveyor 30 in x 160 ft complete. This plant batched only 28,000 yds of concrete on one job. Now dismantled on ground and ready to be loaded on your truck. Cost new in 1955 $67,000. selling price $21,000. located near Philadelphia, Pa. This plant purchased by us for a job that fell through.

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All sizes, new and rebuilt. Starters, accessories, pulleys and repair parts. Gear motors, Falk Shaft mounted Speed Reducers, couplings and V-belt drives.

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Cedarapids 3030 double impeller. Rebuilt.
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27½ ton, single-compartment 8' x 12' bin.
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Special bins to your specifications.
Conveyors—18"—24"—30"—36". Also conveyor belting.

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Lorain 82 2-yard diesel shovel.
P&H 855B-LC, 2-yd. diesel dragline.
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Lorain 79 1½ yd. diesel shovel.
P&H 655B 1½ yd. diesel dragline.
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Lorain L-41 ¾-yd. diesel backhoe.
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Lorain L-40 ¾-yard diesel crane.
Lorain TL25S ¾-yard gas clam-crane.
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Koehring 304 ¾-yd. diesel shovel.
Koehring 304 ¾-yd. diesel backhoe.
Buckeye 70 ¾-yd. diesel shovel.
2—Lorain MC-414 20-ton Moto-Cranes.
Link Belt HC-90 25-ton truck crane.
Lorain MC-4 15-ton Moto-Crane.
Lorain MC-3 12½-ton gas moto-crane.
Lorain TL-20 10-ton gas moto-crane.

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6—Euclid TS-24 twin engine scrapers.
4—Euclid 18-yd. overhung engine scrapers.
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1—Caterpillar D-8 with cable bulldozer blade.
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Lorain 50, 1-yd., 21' boom, 17' stick.
Lorain 40, ¾-yd., 19' boom, 16' stick.
Lorain 30A, ½-yd., 16' boom, 13'4" stick.
Osgood 903, 2-yd., 24' boom, 20'6" stick.
P&H 855, 2-yd., 24' boom, 17'6" stick.

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Lorain 40A, 18' boom, 7' stick, 28", 36" or 44" bucket.
Koehring 304, 19' boom, 5' stick.

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Cat. D2700, 74 H.P. at 1000 PFM. Rebuilt.
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GMC Twin Diesel, rebuilt.
GMC 3021C, 3-cylinder, new.

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105 cu. ft. Ingersoll-Rand gas portable.
125 cu. ft. Jaeger gas portable.
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420 cu. ft. Gardner-Denver two-stage stationary. Rebuilt.

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Complete staty. STONE PLANT w/2436 Jaw, 2XB mill, ¾ yd shovel, feeder, power tractor. Part or all midwest. Many other PORTABLE Plants.
CRUSHERS: 1036, 1538, 1836, 2036, 2138, 2340, 3042, 3642, 4240, 4836 JAW. 10, 16, 18, 36" McCully. 24", 20" & 4' Traylor. 18, 24, 28, 36" 25B Telsmith. 12", 37½ KVS. 12K GYR. 5424, 4022, 3018 ROLL. 2, 3, 4' CONES.
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As A Complete Package
Complete Quarry Plant
Capacity—200 ton per hour

Universal Jaw Crusher, Size 30" x 42", Serial W.R.B. 29507, Roller Bearing, 15 V Belts.
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Roll Crusher, Size 30" x 18", Serial #6870, Roller Bearing, V-Belt Drive.
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Steel Bin by Clinton Bridge Works, 2 compartment, 100 ton each.
30" Belt Conveyors, one—29' 2" long, & one—128' 8" long, driven by 20 H.P. Electric Motor.
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Lima Shovel, Type 34, Serial #4786, 18' boom, 15' dipper handle, ¾ yd. dipper, General Motors Power Plant, Serial #3-71-29675, Drag Line, 85' boom, Clam Shell, 45' boom, Crane 2—20 ft. sections of Boom making total of 85' boom, back hitch gantry (high).
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Ingersoll Rand Wagon Drill, Serial #6824, Type F.M. 2, Hammer 8 1 x 71 WD.
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Capacity 500-600 tons per hr. Available lease basis, also consider participating mining or large rock-crushing operation.

1—84x66 Primary Jaw Crusher
5—29-T Bucyrus Drills diesel
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One Model LS90 Link Belt Crane, Serial Number 7AN860. Powered With a Cat D-8800 Diesel Engine, 60' Boom. This Machine Is Clean and In Excellent Shape. Price FOB Nashville, Tennessee $13,500.00

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EUCLID-TENNESSEE, INC.
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Agassiz Lime Quarry. Agassiz, B.C., Canada. Agricultural and barn lime—50 yrs. supply of stone at present rate. Sales can be developed by business know how. Plant, stone, modern home for $25,000. Ill health forces sale.

Mr. Hiram Cutler **Agassiz Lime Quarry**
Agassiz, B.C., Canada

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One Pioneer 3x8 Triple Deck Screen, Serial Number 282A377. In Excellent Operating Condition.
Price FOB Nashville, Tennessee ...$1,150.00

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Hardinge Conical Ball Mills
4½' dia. x 16"; 5' dia. x 22". Complete with classifiers, motors, balls, electric accessories, etc.
Kiln—2' D x 18' Complete. Gas Fired. Brick lined.

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2—#4½ Champion Jaw Crusher 10" x 20"
1—Allis-Chalmers Jaw Crusher, Blake Type 10" x 20"
1—Reliance Jaw Crusher 15" x 30"
1—36" x 20' Revolving Screen
1—36" x 11' Revolving Screen with Srubber
—30" x 14' Revolving Screen
1—3' x 5' Link-Belt Foundry Shakeout Screen All-Steel & Manganese J. & H. Hammer Mills
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4—AC Tube Mill 5½ x 220" with Drive

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Smith 7⅝ Yd. Agitator mounted on 1952 Autocar Tandem Axle
Smith 5½ Yd. Agitator mounted on 1951 Mack Diesel Tandem Axle
Smith 7⅝ Yd. Agitators mounted on 1953 Mack Diesel Tandem Axle (quan. 2)
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Smith 6⅛ Yd. Agitator mounted on 1950 Mack Tandem Axle
Jaeger 6¼ Yd. Agitator mounted on 1950 Mack Tandem Axle
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LIPPMANN 24x36 rb. Jaw Crusher Portable Primary w/feeder, conveyor, Cat. diesel, tandem rubber. New jaw dies in crusher. $13,500 Milford, Utah
CEDARAPIDS 2A Portable Plant w/1624 rb. Rolls, 3x8 2-deck horizontal screen, rotovator, plant & delivery conveyors, power unit, V-belt drive, tandem rubber. Unused. Excellent. 40% of new price. $8,000 Cleveland, Ohio
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SECO 4x14 2-deck screen, good. $1250.
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Rotary Kilns and Dryers,
All Sizes, any make.

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One Lorain Model L-85 Shovel, Serial Number 27757, Powered With Caterpillar D337F Turbo Charged Diesel Engine. Complete With Torque Converter and Tail Shaft Governor. 24' Dipper Stick, 2½ Cu. Yd. Dipper. New in 1956. In Excellent Condition. Must Be Seen To Be Appreciated. Less Than 2,000 Hours On This Machine. Price FOB Crossville, Tennessee $57,500.00

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304 Koehring combination shovel and crane with Chrysler Industrial Gasoline Power.

One yard Page RC Dragline Bucket.

Two Buda eight cylinder Diesel engines complete with radiators, Twin Disc clutches and V Belt sheaves.

One General Electric 240 KW 480 Volt AC Generator complete with V Belt sheaves, outboard bearing and control panel board.

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Pontiac, Illinois

2 & 3' Cone Crushers—Excellent Cond.
4'x12' Simplicity Heavy Duty Screen
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600' Portable Air Compressors—Diesel
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75 HP 220/440 V, 3500 RPM BB Motor

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Northwest Model 6 Shovel, 1½ cy.
Caterpillar D8 Bulldozer
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1—36"x14'3" Telsmith Apron Feeder. New. Never taken out of crate.

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5—1372 CFM Gardner Denver 2300 V
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1—6 ton 1—8 ton Brookville

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175 H.P. 3 Drum Hoist, 25 HP. Swinger

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1500 ton MZ 32, DP 2, AP 3, 30' & 60'

STEEL DERRICKS
Guy: 3 ton 85 ft. Boom, 25 ton 60 ft. Boom, 15 ton 100' Boom, 20 ton 115' Boom, 50 ton 100' Boom.
Stiff Leg: 5 ton 70 ft. Boom, 15 ton 100 ft. Boom, 25 ton 100 ft. Boom, 75 ton 135 ft. Boom. 1—8 ton 100 ft. Boom.

RAILWAY CARS
177—Dump Std. Ga. 20, 16, 12, 6 & 4 yd.
36—Flats—10 ton, 40 ton, 50 ton cap.
44—Tank Cars—8,000 & 10,000 Gal. Cap.
75—V Dump Cars, 1½ & 2 Yd.

GRINDING MILLS
Ball Mills—4'6"x9', 6'7"x6', 6'x10', No. 77 and 6'6" x 14'6"
Hardinge Mills—5'x22", 7'x48" and 10'x36"
Special—NEW 8'x60" Hardinge Ball Mill
Rod Mills—3'x6', 3'x8', 4'x8', 5'x10'
Tube Mills—5'x22', 6'x23', 6'x6"x21' & 7'x18"

HAMMER MILLS
Jeffrey—15"x8", 24"x18" and 42"x36"
Pennsylvania SXT-B-48 THOR, SXC 13-50 Reversible and SXT-8
Cedar Rapids 5360H and 3030 Double Impeller Impact Breaker
Williams—GA-60 44"x60" feed opening

JAW CRUSHERS
Blake Type 56"x72", 48"x60", 36"x42", 40"x42" 36"x48", 30"x42", 30"x36", 12"x24", 48"x60"
Single Shaft 30"x42", 25"x40", 24"x36", 20"x36", 18"x24" and 10"x24"
Cam and Roller 16"x32", 14"x26", 11"x26", 10"x36" and 6"x20"

GYRATORY FINE REDUCTION
Symons 20", 3' and 4' stand. and 2' Shorthead
Kennedy 19B, 25S and 27S
Sup. MeC. 6", 10" and 18"
Traylor 3 and 4' Type TY

GYRATORY PRIMARY
6", 10", 14", 16", 26" and 30" Sup. MeC.
3, 4, 5, 6, 7½, 8, 9, 12 Allis-Chalmers Gates Style K
Telsmith 25B ANDIOA

ROTARY DRYERS AND KILNS
Dryers—4'x20', 5'-6"x50', 6'x50', 80"x60'
Kilns 4' x 20', 2 - 8' x150', 7'6" and 9'6" x 200', 7'6" and 11'6" x 200'

WASHERS—CLASSIFIERS
78"x36'x6" Duplex Akins Spiral Classifier
36"x25' Eagle Twin Screw Fine Material Classifier-Washer-Dewaterer
Telsmith 20"x15' Twin Screw Sand Classifier and Size 10 Sand Tank
Eagle 20"x15' Single Screw Coarse Material Washer-Dewaterer
McLanahan—10"x30' and 12"x30' Log Washers

CEDAR RAPIDS SECONDARY PORTABLE CRUSHER
Model 2A, 24"x16" Rolls, 3'x8'—1¼ Deck Screen, Roto elevator, 4 conveyors, gasoline engine on pneumatic tires

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3 Seco 4x8 DD-2—5'x14'x3D

FEEDERS
Syntron Model F55 Grizzley Feeder
42" x 12' Lippman Apron Feeder
54" x 16' S-A Heavy Duty Feeder
60" x 15' Traylor Heavy Duty Apron Feeder

IDLE PLANTS BOUGHT

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60 E. 42nd St., New York 17, N. Y.
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DEPENDABLE USED MACHINES

Special: American 25 ton truck crane 375 BT, powered by gas engine, w/75' boom.

H&B 6" pump	Bay City 25 dragline	Pioneer 30x12 conveyor
Shields Bantam	Galion Jr. Patrol Grader	Pioneer 30x14 conveyor
2 yd. Dumpcrete	Pioneer 3x10 d.d. screen	Pioneer 30x20 conveyor
Agricat bulldozer	Harris Power Horse Hi-Lift	30x38 portable conveyor
Terratrac Model 400	Universal 3½x18' d.d. screen	4-wheel Bay City 12 t. trailer

This equipment rebuilt in our modern plant by expert mechanics. Come see it!

10004 Southwest Highway TRACTOR & EQUIPMENT CO. Oak Lawn, Ill.

CRUSHER AND SCREEN FOR SALE

One K. V. S. 50 H.P. 12" primary crusher and one 3'x10' double deck vibrating screen. This first class equipment which is in operating condition has been replaced by a higher capacity plant.

CARBOLA CHEMICAL CO., INC.
Natural Bridge, New York

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TRANSFORMERS
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WORLD'S LARGEST INVENTORY
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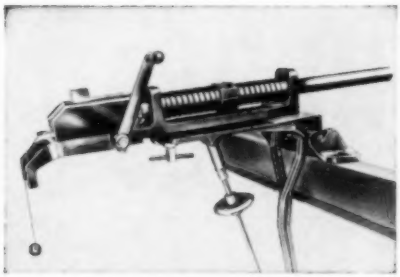
Here's the easy, cost-saving way to remove Clinker Rings—



WITHSTANDS HIGH TEMPERATURES AT KILN HOOD. Special steels and castings enable the Remington Industrial Gun to operate safely at kiln hood temperatures. Gun is easily installed by attaching bolster to hood I-Beam or movable mount as shown.

Remington Industrial Gun

You save valuable man-hours in removing clinker rings with the hard-hitting Remington Industrial Gun. A pull of the gun's lanyard does the work of many sledge hammers... brings rings and other troublesome kiln formations down in minutes!

No need to wait until kiln cools off. In fact, you don't have to turn off flame or stop rotation until you're ready to shoot. Then just load . . . aim at ring juncture and BAM—the 9,000 ft.-lbs. of knockdown power from a Remington Industrial Magnum* shell smash into the ring! It takes only a short time to dislodge it—without damage to kiln or lining—and you're quickly back on full-time schedule.

Here's proof: One Georgia refractory saved 222 man-hours and gained 26 hours' production time per month with this easy-to-use, one-man tool. So don't let clinker rings "bottleneck" your plant, let the Remington Industrial Gun cut downtime to a minimum. Just clip and mail coupon for our illustrated, fact-filled folder.

** For shorter kilns, Remington Standard Industrial Shells fill the bill. 7,500 ft.-lbs. of energy are delivered!*

Remington

DUPONT

Remington also manufactures the Model 455 and "Mighty-Mite" Stud Drivers for instant fastening into concrete or steel.

Industrial Sales Division, Dept. PQ-5.
Remington Arms Company, Inc.
Bridgeport 2, Conn.

Please send me your free booklet which shows how the Remington Industrial Gun speeds removal of clinker rings.

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Firm_____

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City_____ State_____

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Accident! But Anaconda SH-D Shovel Cable kept on working in this open-pit mine. Good proof of Anaconda Cable's ability to take it.

CAVE-IN! But this unposed photo shows Anaconda Shovel Cable still working!

Above you see part of an actual cave-in. The Man from Anaconda was Johnny-on-the-spot with a camera, and the picture shows part of what he saw. The complete cave-in was much more extensive.

We use this photo to show how well Anaconda Shovel Cable stands up under abuse. Jagged rocks, sheer drops over cliffs, water-filled ditches—the Anaconda cable is built to endure all these hazards.

We're miners ourselves. All our practical experience—plus knowledge of what makes the best insulation and protective coverings—has gone into this cable.

Anaconda Shovel Cable has a strong, extra-tough—yet highly flexible—neoprene jacket. It resists abrasion, mechanical abuse, flame and water. Its long-lasting Anaconda Butyl Insulation has high dielectric strength, and outstanding resistance to ozone, heat and moisture.

It all adds up to a cable that's ready when the going's rough. For full information about this rugged shovel cable, contact the Man from Anaconda or your Anaconda distributor. Or write directly to: Anaconda Wire & Cable Company, 25 Broadway, New York 4, New York.

58317

LIVE BETTER ELECTRICALLY

SEE THE MAN FROM ANACONDA®

FOR SHOVEL CABLE

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Lima Type 1201 Shovel, owned by the Consumers Company of Chicago. Shown excavating limestone near McCook, Ill. The machine is equipped with a 32-ft. boom, 22-ft. dipper handle and 3½-cu. yd. dipper.

LIMAS prove their ruggedness and stamina in the quarries of Consumers Company

Robert J. Hummel, vice president and general manager of Consumers Company, a division of Vulcan Materials Company, says: "We bought our first Lima over 11 years ago. We now have six Lima 1201 Shovels in use in our quarries and gravel plants. Three of these shovels have been used in our quarries at McCook and Bellwood, Ill. We believe that quarry work is as severe a test of ruggedness and stamina as a shovel can be subjected to. We are glad to report that the 1201's stood up to this work and took their beating in stride.

"Incidentally, we have operated both of these quarries during severe winter weather during the last several years because of the press of business. We realize that cold weather puts an extra stress on the metal of equipment, and the Limas have come through this test with flying colors. Besides being tough machines, our operators say that the air controls make these shovels very easy to handle."

Boost the profits in your operation. Get the full story on quality-built Limas from your nearby distributor . . . or write Construction Equipment Division, Baldwin-Lima-Hamilton Corporation, Lima, Ohio.

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Shovels • Cranes • Draglines • Pullshovels • Roadpackers • Crushing, Screening and Washing Equipment

5826

BALDWIN BLH LIMA-HAMILTON

Steam supply line runs the full length of 9 kilns, with a Honeywell valve controlling the steam supply to each kiln. Brown thermometer-controllers operate these valves to regulate kiln temperature. ▶

Steam use and curing time reduced 40% for concrete blocks

J. R. Asbell Block Company of Panama City, Florida, saves steam and increases production by the use of Brown recording thermometer-controllers on their new fully sealed kilns.

The thermometer-controllers allow the proper amount of steam to enter the kilns in order to maintain curing temperature. Steam consumption has been cut almost in half. Curing time is now three hours instead of five. With the close temperature control provided by the instruments and sealing of the kilns, an ideal curing temperature of 180°F. is maintained. This precise temperature regulation has cut culls to a new minimum.

To learn how you can put these instruments to work profitably in your own plant, call your nearby Honeywell field engineer. He's as near as your phone.

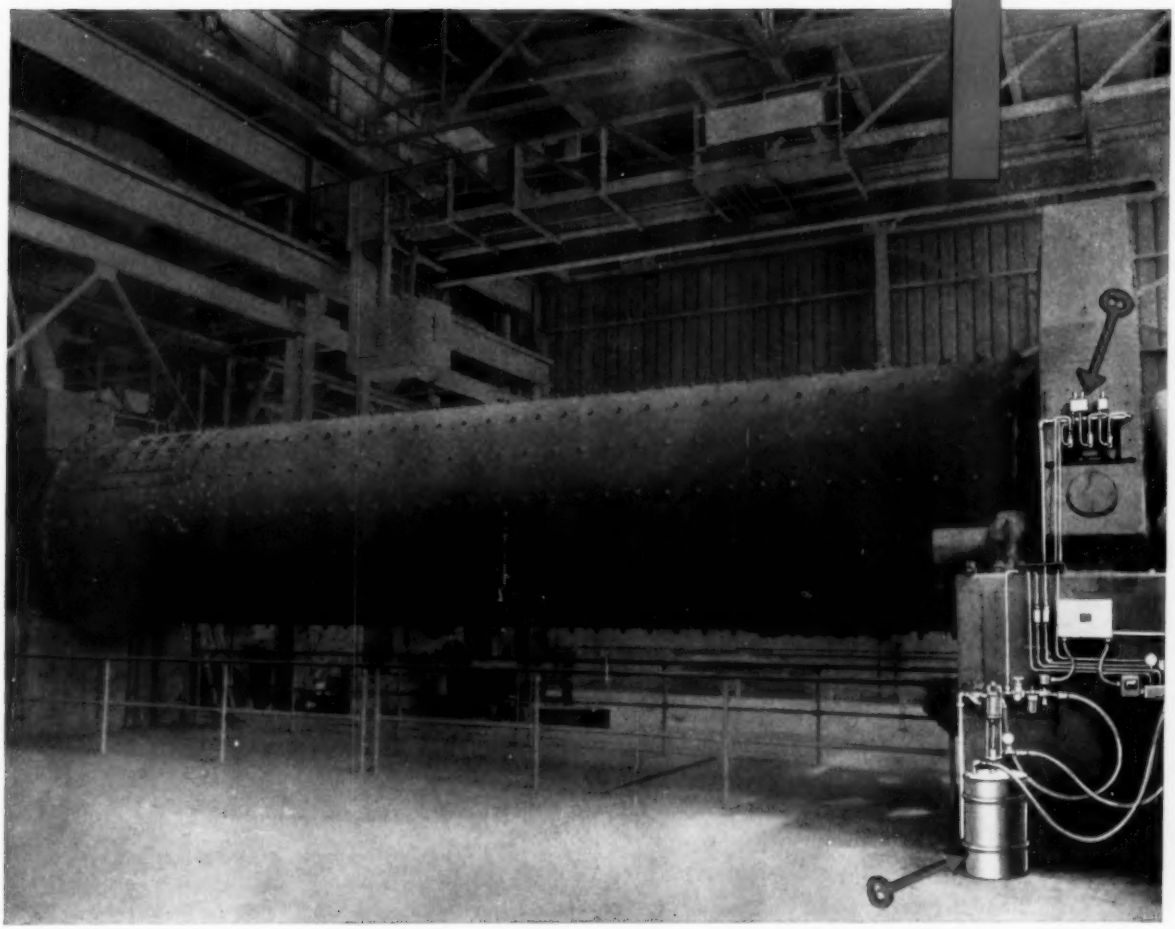
MINNEAPOLIS-HONEYWELL REGULATOR Co., *Industrial Division*, Wayne and Windrim Avenues, Philadelphia 44, Pa.

Honeywell

H HONEYWELL *First in Controls*

Farval Spray Panel lubricates ball mill at Canada's farthest north cement plant

FARVAL—
Studies in Centralized Lubrication
No. 198



KEYS TO ADEQUATE LUBRICATION—
One of five 2-compartment 8′ x 37′ Allis Chalmers raw mills at Inland Cement Company Limited. Note Farval Automatic Spray Lubrication System at right above. Controlled by a timer, Farval sprays high viscosity grease on gear and pinion every 6 minutes.

● Lubrication of the ball mills for this most northerly cement plant is sure, safe and economical. The main gears and pinions are protected by a Farval system of automatic spray lubrication.

This mill is located in the $12,500,000 cement plant built recently at Edmonton, Canada, and now operating at near capacity to serve the expanding industry centering in Alberta's booming oil fields.

Farval automatic lubrication also is growing—in wider and wider use throughout industry and in ever increasing benefits to users. Hundreds of spray lubrication systems have been installed on gears and sliding surfaces. Millions of bearings are served by Farval manual and automatic systems.

There's a Farval system designed to serve your needs, too. It can save you money 4 ways—in oiling labor, in reduced downtime of equipment, in bearing expense eliminated and in lubricant saved.

Ask us to mail Farval Bulletin 26-R. And a representative will call at your convenience. The Farval Corporation, 3280 East 80th Street, Cleveland 4, Ohio.

Affiliate of The Cleveland Worm and Gear Company, Industrial Worm Gearing. In Canada: Peacock Brothers Limited.

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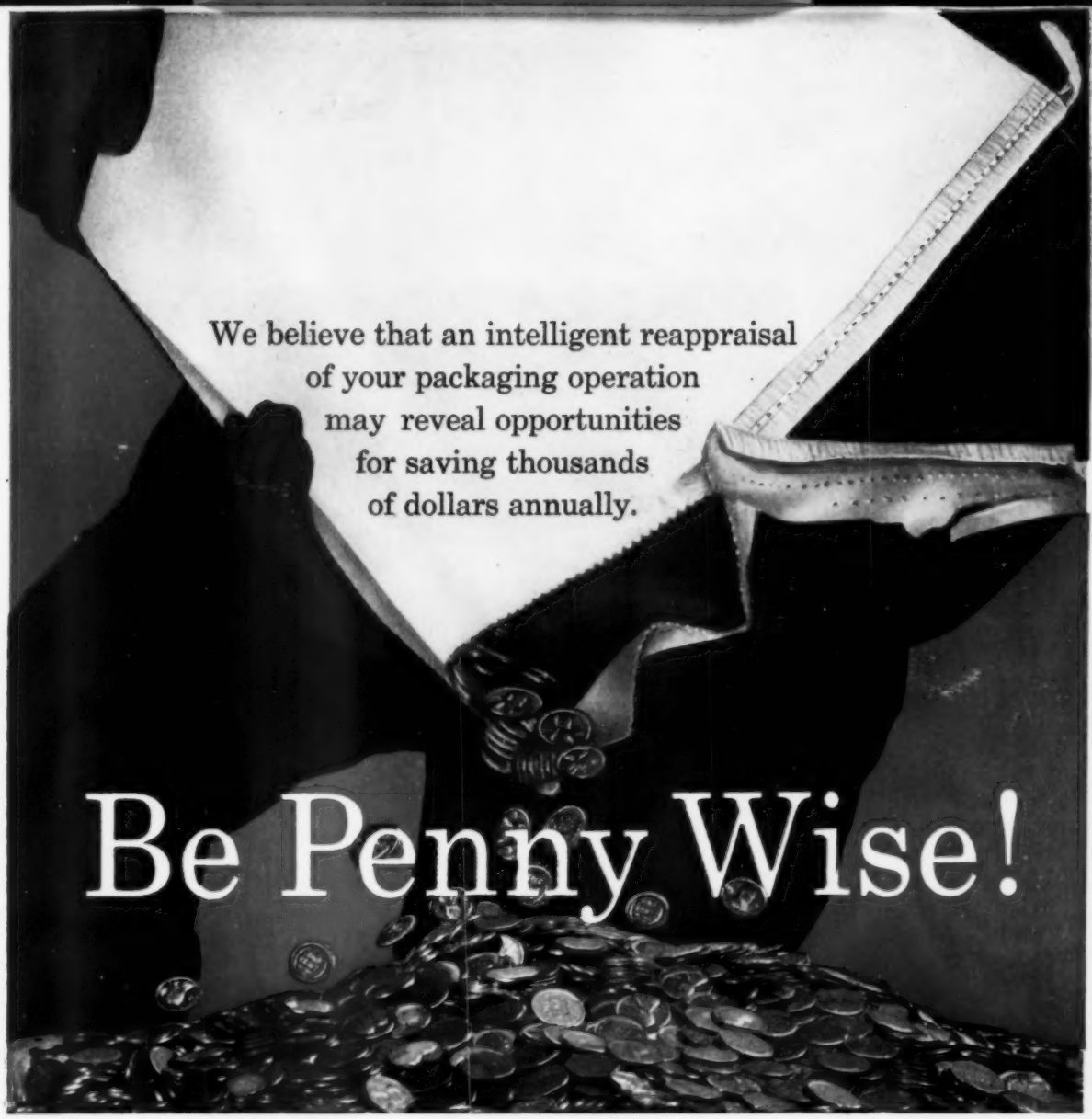

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THE KRAFTPACKER Open Mouth Bag Filling Machine, for free-flowing material, automatically saves pennies, too, through higher production and greater accuracy. Requires a lower investment and maintenance cost than any other automatic machine of its type in use today!

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